# ALL COLLECTION DATA SHEETS OPTICAL FILTERS

## CONTENT



**Status: Oct. 2011**

SCHOTT
glass made of ideas

# Data Sheet

SCHOTT

## BG3

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (365 nm) | ≥ | 0.94 |
| τi (633 nm) | ≤ | 5 · 10-5 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 302.1 | Hg | 1.55 |
| 435.8 | Hg | 1.52 |
| 587.6 | He | 1.51 |
| 1014 | Hg | 1.50 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.56 |

| Bubble content | |
|---|---|
| Bubble class | 1 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 478 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 8.8 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 10.2 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |

| Notes |
|---|
| |
| Ionically colored glass |
| |
| Band pass filter |
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| V |
| Transmission changes are possible |
| under the action of intense |
| ultraviolet radiation |
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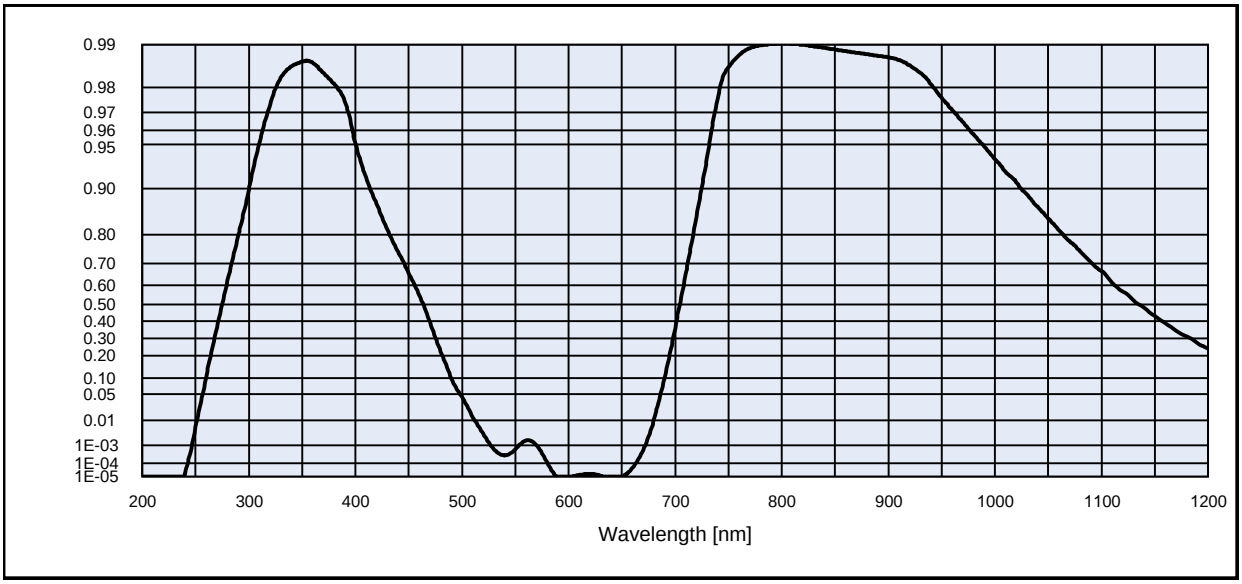
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.160 | 0.166 | 0.170 |
| y | 0.042 | 0.024 | 0.020 |
| Y | 1 | 0 | 0 |
| $\lambda_d$ [nm] | 458 | 447 | 440 |
| $P_e$ | 0.96 | 0.98 | 0.98 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.157 | 0.163 | 0.167 |
| y | 0.038 | 0.022 | 0.018 |
| Y | 1 | 0 | 0 |
| $\lambda_d$ [nm] | 457 | 447 | 442 |
| $P_e$ | 0.97 | 0.98 | 0.99 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.154 | 0.160 | 0.163 |
| y | 0.029 | 0.018 | 0.014 |
| Y | 2 | 1 | 0 |
| $\lambda_d$ [nm] | 455 | 448 | 444 |
| $P_e$ | 0.98 | 0.99 | 1.00 |



# BG3

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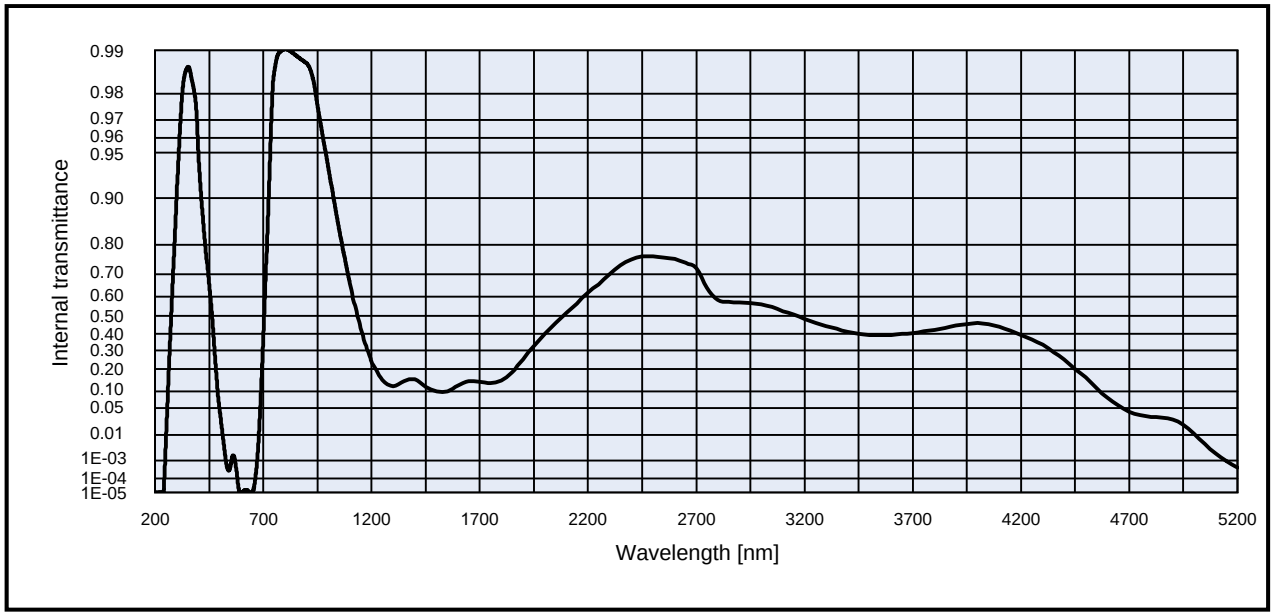


**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 4.3E-02 | 800 | 9.9E-01 | 1100 | 6.7E-01 | 2200 | 6.2E-01 | 3700 | 4.0E-01 |
| 210 | < 1.0E-05 | 510 | 1.3E-02 | 810 | 9.9E-01 | 1110 | 6.2E-01 | 2250 | 6.6E-01 | 3750 | 4.1E-01 |
| 220 | < 1.0E-05 | 520 | 3.2E-03 | 820 | 9.9E-01 | 1120 | 5.7E-01 | 2300 | 7.0E-01 | 3800 | 4.2E-01 |
| 230 | < 1.0E-05 | 530 | 6.4E-04 | 830 | 9.9E-01 | 1130 | 5.2E-01 | 2350 | 7.3E-01 | 3850 | 4.3E-01 |
| 240 | 1.9E-05 | 540 | 3.0E-04 | 840 | 9.9E-01 | 1140 | 4.8E-01 | 2400 | 7.5E-01 | 3900 | 4.5E-01 |
| 250 | 6.1E-03 | 550 | 6.2E-04 | 850 | 9.9E-01 | 1150 | 4.3E-01 | 2450 | 7.6E-01 | 3950 | 4.6E-01 |
| 260 | 1.0E-01 | 560 | 1.7E-03 | 860 | 9.9E-01 | 1160 | 3.9E-01 | 2500 | 7.7E-01 | 4000 | 4.6E-01 |
| 270 | 3.6E-01 | 570 | 1.0E-03 | 870 | 9.9E-01 | 1170 | 3.4E-01 | 2550 | 7.6E-01 | 4050 | 4.6E-01 |
| 280 | 6.3E-01 | 580 | 1.1E-04 | 880 | 9.9E-01 | 1180 | 3.1E-01 | 2600 | 7.6E-01 | 4100 | 4.4E-01 |
| 290 | 8.0E-01 | 590 | < 1.0E-05 | 890 | 9.9E-01 | 1190 | 2.7E-01 | 2650 | 7.4E-01 | 4150 | 4.2E-01 |
| 300 | 9.0E-01 | 600 | < 1.0E-05 | 900 | 9.9E-01 | 1200 | 2.4E-01 | 2700 | 7.2E-01 | 4200 | 3.9E-01 |
| 310 | 9.5E-01 | 610 | 1.3E-05 | 910 | 9.9E-01 | 1250 | 1.5E-01 | 2750 | 6.4E-01 | 4250 | 3.7E-01 |
| 320 | 9.7E-01 | 620 | 1.6E-05 | 920 | 9.9E-01 | 1300 | 1.2E-01 | 2800 | 5.9E-01 | 4300 | 3.4E-01 |
| 330 | 9.8E-01 | 630 | 1.2E-05 | 930 | 9.8E-01 | 1350 | 1.4E-01 | 2850 | 5.8E-01 | 4350 | 2.9E-01 |
| 340 | 9.9E-01 | 640 | < 1.0E-05 | 940 | 9.8E-01 | 1400 | 1.5E-01 | 2900 | 5.7E-01 | 4400 | 2.5E-01 |
| 350 | 9.9E-01 | 650 | < 1.0E-05 | 950 | 9.8E-01 | 1450 | 1.2E-01 | 2950 | 5.7E-01 | 4450 | 2.0E-01 |
| 360 | 9.9E-01 | 660 | 4.7E-05 | 960 | 9.7E-01 | 1500 | 1.0E-01 | 3000 | 5.6E-01 | 4500 | 1.6E-01 |
| 370 | 9.8E-01 | 670 | 5.9E-04 | 970 | 9.7E-01 | 1550 | 1.0E-01 | 3050 | 5.5E-01 | 4550 | 1.1E-01 |
| 380 | 9.8E-01 | 680 | 1.0E-02 | 980 | 9.6E-01 | 1600 | 1.2E-01 | 3100 | 5.3E-01 | 4600 | 7.8E-02 |
| 390 | 9.8E-01 | 690 | 1.0E-01 | 990 | 9.5E-01 | 1650 | 1.4E-01 | 3150 | 5.1E-01 | 4650 | 5.6E-02 |
| 400 | 9.5E-01 | 700 | 3.6E-01 | 1000 | 9.4E-01 | 1700 | 1.4E-01 | 3200 | 4.8E-01 | 4700 | 4.2E-02 |
| 410 | 9.2E-01 | 710 | 6.6E-01 | 1010 | 9.2E-01 | 1750 | 1.3E-01 | 3250 | 4.6E-01 | 4750 | 3.5E-02 |
| 420 | 8.7E-01 | 720 | 8.5E-01 | 1020 | 9.1E-01 | 1800 | 1.4E-01 | 3300 | 4.4E-01 | 4800 | 3.2E-02 |
| 430 | 8.2E-01 | 730 | 9.4E-01 | 1030 | 8.9E-01 | 1850 | 1.8E-01 | 3350 | 4.3E-01 | 4850 | 3.1E-02 |
| 440 | 7.5E-01 | 740 | 9.8E-01 | 1040 | 8.7E-01 | 1900 | 2.5E-01 | 3400 | 4.1E-01 | 4900 | 2.7E-02 |
| 450 | 6.6E-01 | 750 | 9.9E-01 | 1050 | 8.4E-01 | 1950 | 3.3E-01 | 3450 | 4.0E-01 | 4950 | 2.0E-02 |
| 460 | 5.5E-01 | 760 | 9.9E-01 | 1060 | 8.1E-01 | 2000 | 4.0E-01 | 3500 | 3.9E-01 | 5000 | 1.1E-02 |
| 470 | 3.9E-01 | 770 | 9.9E-01 | 1070 | 7.8E-01 | 2050 | 4.6E-01 | 3550 | 3.9E-01 | 5050 | 5.1E-03 |
| 480 | 2.2E-01 | 780 | 9.9E-01 | 1080 | 7.5E-01 | 2100 | 5.2E-01 | 3600 | 3.9E-01 | 5100 | 2.0E-03 |
| 490 | 9.7E-02 | 790 | 9.9E-01 | 1090 | 7.1E-01 | 2150 | 5.7E-01 | 3650 | 4.0E-01 | 5150 | 9.1E-04 |

# Data Sheet

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## BG7

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (365 nm) | ≥ | 0.25 |
| τi (488 nm) | ≥ | 0.78 |
| τi (633 nm) | ≤ | 0.08 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 404.7 | Hg | 1.54 |
| 587.6 | He | 1.52 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.61 |

| Bubble content | |
|---|---|
| Bubble class | 1 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 468 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 8.5 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.9 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |

| Notes |
|---|
| |
| Ionically colored glass |
| |
| Band pass filter |
| |
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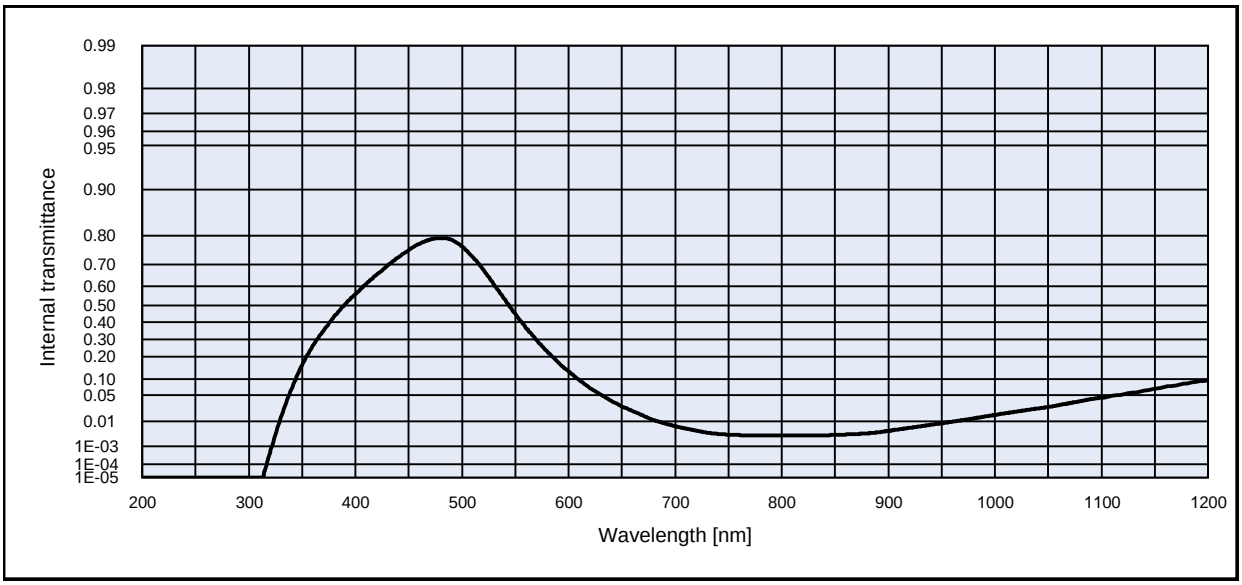
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.262 | 0.179 | 0.145 |
| y | 0.406 | 0.360 | 0.317 |
| Y | 30 | 14 | 8 |
| $\lambda_d$ [nm] | 495 | 492 | 490 |
| $P_e$ | 0.44 | 0.65 | 0.76 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.246 | 0.172 | 0.143 |
| y | 0.382 | 0.333 | 0.292 |
| Y | 31 | 16 | 9 |
| $\lambda_d$ [nm] | 493 | 490 | 488 |
| $P_e$ | 0.45 | 0.66 | 0.76 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.191 | 0.152 | 0.138 |
| y | 0.272 | 0.229 | 0.200 |
| Y | 38 | 21 | 13 |
| $\lambda_d$ [nm] | 486 | 484 | 482 |
| $P_e$ | 0.49 | 0.68 | 0.76 |



# BG7

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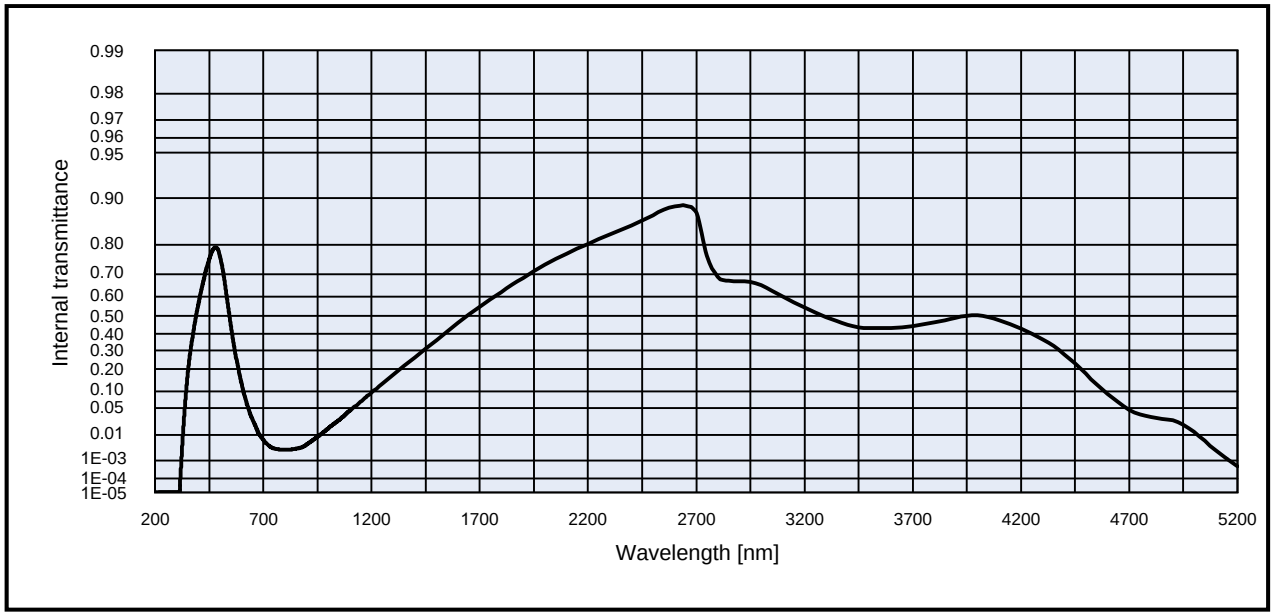


**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 7.7E-01 | 800 | 3.0E-03 | 1100 | 4.4E-02 | 2200 | 8.0E-01 | 3700 | 4.4E-01 |
| 210 | < 1.0E-05 | 510 | 7.3E-01 | 810 | 3.0E-03 | 1110 | 4.8E-02 | 2250 | 8.2E-01 | 3750 | 4.5E-01 |
| 220 | < 1.0E-05 | 520 | 6.8E-01 | 820 | 3.0E-03 | 1120 | 5.2E-02 | 2300 | 8.3E-01 | 3800 | 4.6E-01 |
| 230 | < 1.0E-05 | 530 | 6.1E-01 | 830 | 3.0E-03 | 1130 | 5.6E-02 | 2350 | 8.4E-01 | 3850 | 4.8E-01 |
| 240 | < 1.0E-05 | 540 | 5.4E-01 | 840 | 3.1E-03 | 1140 | 6.2E-02 | 2400 | 8.5E-01 | 3900 | 4.9E-01 |
| 250 | < 1.0E-05 | 550 | 4.5E-01 | 850 | 3.2E-03 | 1150 | 6.7E-02 | 2450 | 8.6E-01 | 3950 | 5.0E-01 |
| 260 | < 1.0E-05 | 560 | 3.7E-01 | 860 | 3.4E-03 | 1160 | 7.3E-02 | 2500 | 8.7E-01 | 4000 | 5.0E-01 |
| 270 | < 1.0E-05 | 570 | 3.0E-01 | 870 | 3.5E-03 | 1170 | 7.8E-02 | 2550 | 8.8E-01 | 4050 | 4.9E-01 |
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| 300 | < 1.0E-05 | 600 | 1.3E-01 | 900 | 4.6E-03 | 1200 | 9.6E-02 | 2700 | 8.7E-01 | 4200 | 4.3E-01 |
| 310 | < 1.0E-05 | 610 | 9.6E-02 | 910 | 5.3E-03 | 1250 | 1.3E-01 | 2750 | 7.7E-01 | 4250 | 4.0E-01 |
| 320 | 4.7E-04 | 620 | 7.0E-02 | 920 | 6.0E-03 | 1300 | 1.7E-01 | 2800 | 6.9E-01 | 4300 | 3.7E-01 |
| 330 | 1.3E-02 | 630 | 5.1E-02 | 930 | 6.8E-03 | 1350 | 2.2E-01 | 2850 | 6.8E-01 | 4350 | 3.3E-01 |
| 340 | 6.6E-02 | 640 | 3.7E-02 | 940 | 7.7E-03 | 1400 | 2.6E-01 | 2900 | 6.7E-01 | 4400 | 2.8E-01 |
| 350 | 1.6E-01 | 650 | 2.7E-02 | 950 | 8.7E-03 | 1450 | 3.1E-01 | 2950 | 6.7E-01 | 4450 | 2.3E-01 |
| 360 | 2.6E-01 | 660 | 2.1E-02 | 960 | 9.8E-03 | 1500 | 3.6E-01 | 3000 | 6.5E-01 | 4500 | 1.8E-01 |
| 370 | 3.5E-01 | 670 | 1.5E-02 | 970 | 1.1E-02 | 1550 | 4.1E-01 | 3050 | 6.3E-01 | 4550 | 1.3E-01 |
| 380 | 4.4E-01 | 680 | 1.1E-02 | 980 | 1.2E-02 | 1600 | 4.6E-01 | 3100 | 6.0E-01 | 4600 | 9.1E-02 |
| 390 | 5.0E-01 | 690 | 8.6E-03 | 990 | 1.4E-02 | 1650 | 5.1E-01 | 3150 | 5.7E-01 | 4650 | 6.4E-02 |
| 400 | 5.6E-01 | 700 | 6.9E-03 | 1000 | 1.6E-02 | 1700 | 5.5E-01 | 3200 | 5.5E-01 | 4700 | 4.6E-02 |
| 410 | 6.1E-01 | 710 | 5.6E-03 | 1010 | 1.8E-02 | 1750 | 5.9E-01 | 3250 | 5.2E-01 | 4750 | 3.6E-02 |
| 420 | 6.6E-01 | 720 | 4.7E-03 | 1020 | 2.0E-02 | 1800 | 6.2E-01 | 3300 | 4.9E-01 | 4800 | 3.1E-02 |
| 430 | 7.0E-01 | 730 | 4.0E-03 | 1030 | 2.2E-02 | 1850 | 6.6E-01 | 3350 | 4.7E-01 | 4850 | 2.9E-02 |
| 440 | 7.3E-01 | 740 | 3.6E-03 | 1040 | 2.4E-02 | 1900 | 6.9E-01 | 3400 | 4.5E-01 | 4900 | 2.7E-02 |
| 450 | 7.5E-01 | 750 | 3.3E-03 | 1050 | 2.6E-02 | 1950 | 7.1E-01 | 3450 | 4.4E-01 | 4950 | 2.0E-02 |
| 460 | 7.8E-01 | 760 | 3.2E-03 | 1060 | 2.9E-02 | 2000 | 7.4E-01 | 3500 | 4.3E-01 | 5000 | 1.3E-02 |
| 470 | 7.9E-01 | 770 | 3.1E-03 | 1070 | 3.3E-02 | 2050 | 7.6E-01 | 3550 | 4.3E-01 | 5050 | 6.3E-03 |
| 480 | 7.9E-01 | 780 | 3.0E-03 | 1080 | 3.6E-02 | 2100 | 7.7E-01 | 3600 | 4.3E-01 | 5100 | 2.8E-03 |
| 490 | 7.9E-01 | 790 | 3.0E-03 | 1090 | 4.1E-02 | 2150 | 7.9E-01 | 3650 | 4.4E-01 | 5150 | 1.2E-03 |

# Data Sheet

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## BG18

| Density | |
|---|---|
| ρ [g/cm³] | 2.68 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.91 |

| Bubble content | |
|---|---|
| Bubble class | 2 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 2.0 |
| AR class | 2.0 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (350 nm) | ≥ | 0.30 |
| τi (405 nm) | ≥ | 0.65 |
| τi (514 nm) | ≥ | 0.88 |
| τi (633 nm) | ≤ | 0.25 |
| τi (694 nm) | ≤ | 0.03 |
| τi (1060 nm) | ≤ | 5 · 10-4 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 482 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.4 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 8.8 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 404.7 | Hg | 1.55 |
| 587.6 | He | 1.54 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |

| Notes |
|---|
| |
| Ionically colored glass |
| |
| Band pass filter / short pass filter |
| |
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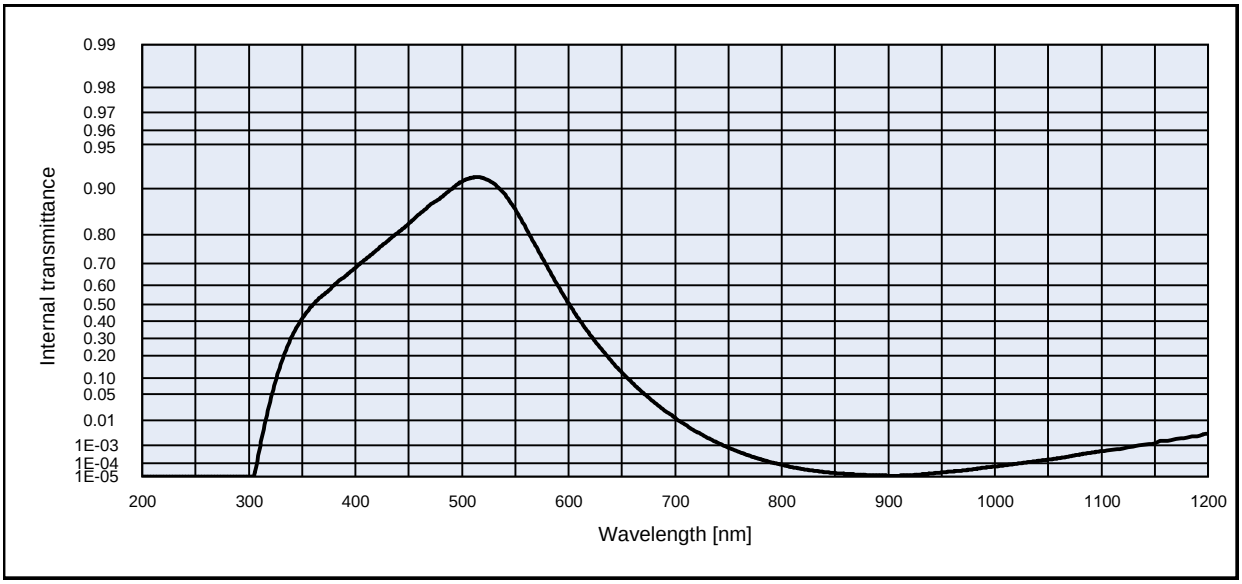
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

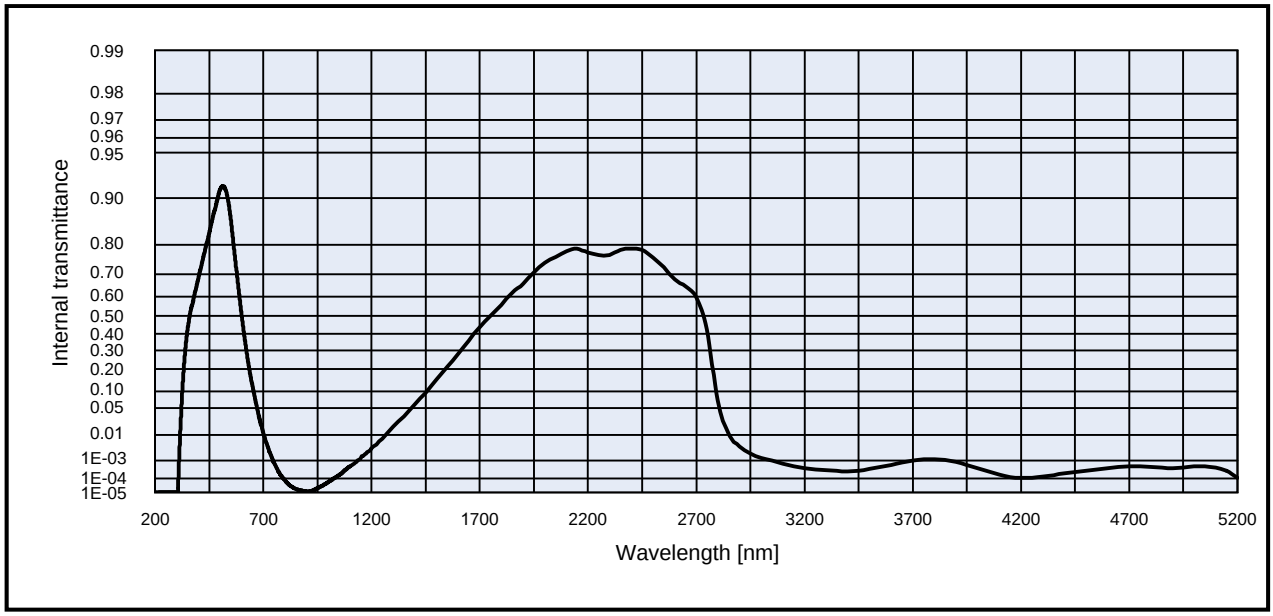
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.361 | 0.309 | 0.275 |
| y | 0.441 | 0.459 | 0.472 |
| Y | 61 | 46 | 37 |
| $\lambda_d$ [nm] | 502 | 501 | 501 |
| $P_e$ | 0.20 | 0.31 | 0.39 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.340 | 0.292 | 0.260 |
| y | 0.426 | 0.441 | 0.451 |
| Y | 62 | 48 | 38 |
| $\lambda_d$ [nm] | 500 | 500 | 500 |
| $P_e$ | 0.20 | 0.32 | 0.39 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.255 | 0.225 | 0.206 |
| y | 0.335 | 0.340 | 0.346 |
| Y | 68 | 54 | 45 |
| $\lambda_d$ [nm] | 493 | 493 | 493 |
| $P_e$ | 0.21 | 0.31 | 0.38 |



# BG18




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.1E-01 | 800 | 7.6E-05 | 1100 | 5.0E-04 | 2200 | 7.8E-01 | 3700 | 1.0E-03 |
| 210 | < 1.0E-05 | 510 | 9.2E-01 | 810 | 5.2E-05 | 1110 | 6.0E-04 | 2250 | 7.7E-01 | 3750 | 1.1E-03 |
| 220 | < 1.0E-05 | 520 | 9.2E-01 | 820 | 3.8E-05 | 1120 | 7.1E-04 | 2300 | 7.7E-01 | 3800 | 1.2E-03 |
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| 260 | < 1.0E-05 | 560 | 8.2E-01 | 860 | 1.7E-05 | 1160 | 1.6E-03 | 2500 | 7.6E-01 | 4000 | 4.0E-04 |
| 270 | < 1.0E-05 | 570 | 7.6E-01 | 870 | 1.5E-05 | 1170 | 1.9E-03 | 2550 | 7.3E-01 | 4050 | 2.7E-04 |
| 280 | < 1.0E-05 | 580 | 6.9E-01 | 880 | 1.3E-05 | 1180 | 2.3E-03 | 2600 | 6.8E-01 | 4100 | 1.8E-04 |
| 290 | < 1.0E-05 | 590 | 6.0E-01 | 890 | 1.2E-05 | 1190 | 2.6E-03 | 2650 | 6.5E-01 | 4150 | 1.3E-04 |
| 300 | < 1.0E-05 | 600 | 5.1E-01 | 900 | 1.2E-05 | 1200 | 3.3E-03 | 2700 | 6.0E-01 | 4200 | 1.1E-04 |
| 310 | 5.6E-04 | 610 | 4.1E-01 | 910 | 1.2E-05 | 1250 | 7.5E-03 | 2750 | 4.3E-01 | 4250 | 1.1E-04 |
| 320 | 3.3E-02 | 620 | 3.2E-01 | 920 | 1.3E-05 | 1300 | 1.8E-02 | 2800 | 7.0E-02 | 4300 | 1.3E-04 |
| 330 | 1.6E-01 | 630 | 2.4E-01 | 930 | 1.5E-05 | 1350 | 3.3E-02 | 2850 | 1.1E-02 | 4350 | 1.6E-04 |
| 340 | 3.1E-01 | 640 | 1.8E-01 | 940 | 1.8E-05 | 1400 | 6.0E-02 | 2900 | 4.0E-03 | 4400 | 2.0E-04 |
| 350 | 4.2E-01 | 650 | 1.2E-01 | 950 | 2.1E-05 | 1450 | 9.6E-02 | 2950 | 2.1E-03 | 4450 | 2.6E-04 |
| 360 | 5.0E-01 | 660 | 8.2E-02 | 960 | 2.6E-05 | 1500 | 1.5E-01 | 3000 | 1.3E-03 | 4500 | 3.0E-04 |
| 370 | 5.5E-01 | 670 | 5.3E-02 | 970 | 3.0E-05 | 1550 | 2.1E-01 | 3050 | 1.0E-03 | 4550 | 3.5E-04 |
| 380 | 6.0E-01 | 680 | 3.3E-02 | 980 | 3.7E-05 | 1600 | 2.8E-01 | 3100 | 7.0E-04 | 4600 | 4.0E-04 |
| 390 | 6.4E-01 | 690 | 2.0E-02 | 990 | 4.8E-05 | 1650 | 3.6E-01 | 3150 | 5.2E-04 | 4650 | 4.7E-04 |
| 400 | 6.8E-01 | 700 | 1.2E-02 | 1000 | 5.8E-05 | 1700 | 4.4E-01 | 3200 | 4.0E-04 | 4700 | 5.1E-04 |
| 410 | 7.2E-01 | 710 | 7.0E-03 | 1010 | 7.1E-05 | 1750 | 5.0E-01 | 3250 | 3.4E-04 | 4750 | 5.0E-04 |
| 420 | 7.5E-01 | 720 | 4.0E-03 | 1020 | 8.8E-05 | 1800 | 5.6E-01 | 3300 | 3.1E-04 | 4800 | 4.7E-04 |
| 430 | 7.8E-01 | 730 | 2.3E-03 | 1030 | 1.1E-04 | 1850 | 6.2E-01 | 3350 | 2.9E-04 | 4850 | 4.3E-04 |
| 440 | 8.1E-01 | 740 | 1.3E-03 | 1040 | 1.3E-04 | 1900 | 6.6E-01 | 3400 | 2.8E-04 | 4900 | 4.2E-04 |
| 450 | 8.3E-01 | 750 | 7.8E-04 | 1050 | 1.6E-04 | 1950 | 7.1E-01 | 3450 | 3.0E-04 | 4950 | 4.5E-04 |
| 460 | 8.5E-01 | 760 | 4.6E-04 | 1060 | 2.0E-04 | 2000 | 7.4E-01 | 3500 | 3.6E-04 | 5000 | 5.0E-04 |
| 470 | 8.7E-01 | 770 | 2.8E-04 | 1070 | 2.6E-04 | 2050 | 7.6E-01 | 3550 | 4.6E-04 | 5050 | 5.0E-04 |
| 480 | 8.9E-01 | 780 | 1.7E-04 | 1080 | 3.3E-04 | 2100 | 7.8E-01 | 3600 | 6.0E-04 | 5100 | 4.2E-04 |
| 490 | 9.0E-01 | 790 | 1.1E-04 | 1090 | 4.1E-04 | 2150 | 7.9E-01 | 3650 | 8.2E-04 | 5150 | 2.9E-04 |

# Data Sheet

SCHOTT

## BG25

| Density | |
|---|---|
| ρ [g/cm³] | 2.56 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Bubble content | |
|---|---|
| Bubble class | 1 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (334 nm) | ≤ | 0.80 |
| τi (405 nm) | ≥ | 0.93 |
| τi (488 nm) | ≤ | 0.39 |
| τi (725 nm) | ≤ | 0.36 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 487 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 8.7 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 10.1 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 404.7 | Hg | 1.53 |
| 587.6 | He | 1.51 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |

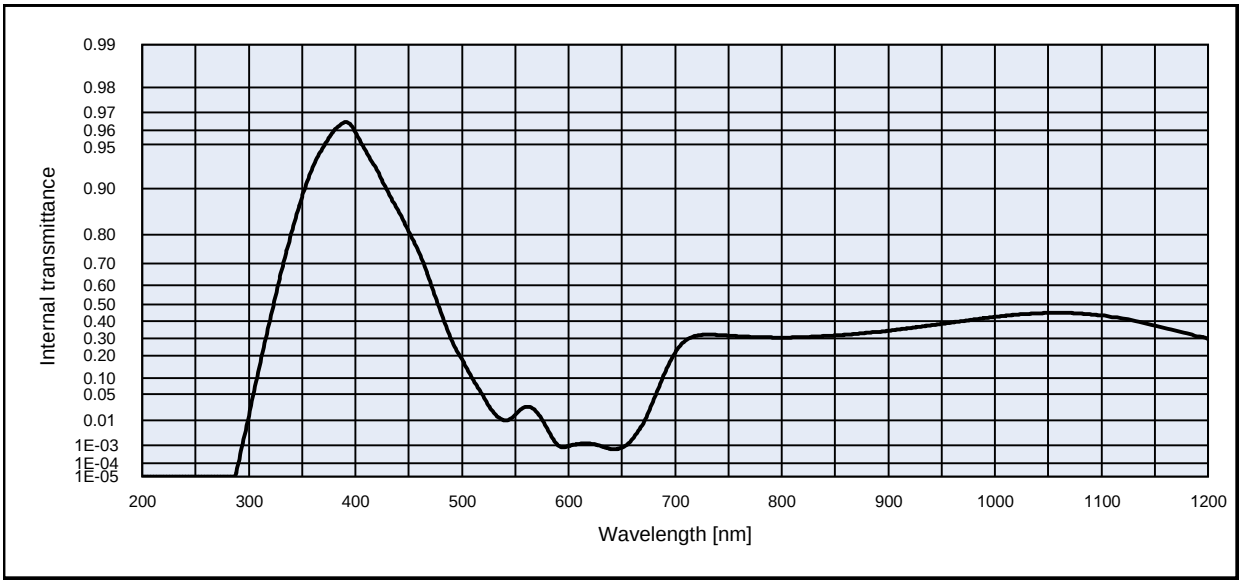
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Band pass filter |
| |
| |
| |
| V |
| Transmission changes are possible |
| under the action of intense |
| ultraviolet radiation |
| |
| |
| |
| |
| |
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

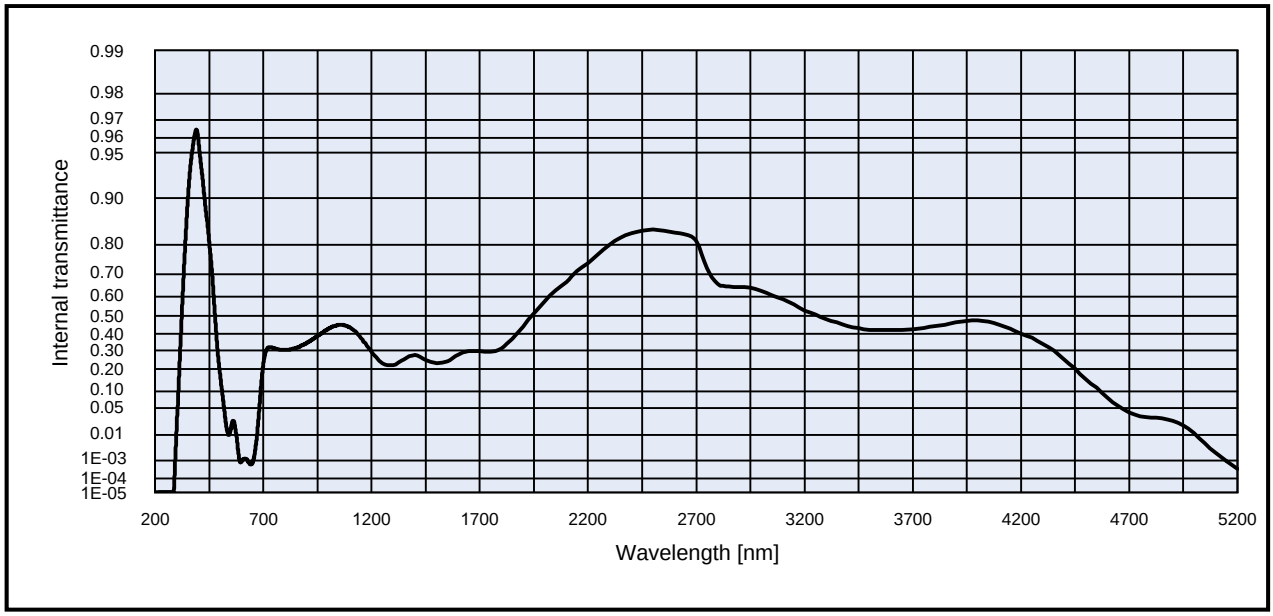
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.155 | 0.151 | 0.155 |
| y | 0.093 | 0.035 | 0.024 |
| Y | 3 | 1 | 0 |
| $\lambda_d$ [nm] | 470 | 459 | 454 |
| $P_e$ | 0.90 | 0.98 | 0.99 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.153 | 0.152 | 0.155 |
| y | 0.083 | 0.033 | 0.023 |
| Y | 3 | 1 | 0 |
| $\lambda_d$ [nm] | 469 | 458 | 453 |
| $P_e$ | 0.91 | 0.98 | 0.99 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.150 | 0.153 | 0.157 |
| y | 0.055 | 0.027 | 0.021 |
| Y | 5 | 2 | 1 |
| $\lambda_d$ [nm] | 463 | 455 | 451 |
| $P_e$ | 0.93 | 0.98 | 0.99 |



# BG25




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 1.8E-01 | 800 | 3.0E-01 | 1100 | 4.3E-01 | 2200 | 7.4E-01 | 3700 | 4.3E-01 |
| 210 | < 1.0E-05 | 510 | 9.7E-02 | 810 | 3.0E-01 | 1110 | 4.3E-01 | 2250 | 7.7E-01 | 3750 | 4.3E-01 |
| 220 | < 1.0E-05 | 520 | 4.5E-02 | 820 | 3.1E-01 | 1120 | 4.2E-01 | 2300 | 8.0E-01 | 3800 | 4.4E-01 |
| 230 | < 1.0E-05 | 530 | 1.7E-02 | 830 | 3.1E-01 | 1130 | 4.1E-01 | 2350 | 8.2E-01 | 3850 | 4.5E-01 |
| 240 | < 1.0E-05 | 540 | 1.0E-02 | 840 | 3.1E-01 | 1140 | 3.9E-01 | 2400 | 8.3E-01 | 3900 | 4.6E-01 |
| 250 | < 1.0E-05 | 550 | 1.5E-02 | 850 | 3.2E-01 | 1150 | 3.8E-01 | 2450 | 8.4E-01 | 3950 | 4.7E-01 |
| 260 | < 1.0E-05 | 560 | 2.5E-02 | 860 | 3.2E-01 | 1160 | 3.6E-01 | 2500 | 8.4E-01 | 4000 | 4.8E-01 |
| 270 | < 1.0E-05 | 570 | 1.8E-02 | 870 | 3.3E-01 | 1170 | 3.5E-01 | 2550 | 8.4E-01 | 4050 | 4.7E-01 |
| 280 | < 1.0E-05 | 580 | 5.2E-03 | 880 | 3.3E-01 | 1180 | 3.3E-01 | 2600 | 8.3E-01 | 4100 | 4.5E-01 |
| 290 | 8.5E-05 | 590 | 1.0E-03 | 890 | 3.4E-01 | 1190 | 3.1E-01 | 2650 | 8.3E-01 | 4150 | 4.3E-01 |
| 300 | 1.4E-02 | 600 | 9.1E-04 | 900 | 3.4E-01 | 1200 | 2.9E-01 | 2700 | 8.1E-01 | 4200 | 4.0E-01 |
| 310 | 1.4E-01 | 610 | 1.2E-03 | 910 | 3.5E-01 | 1250 | 2.3E-01 | 2750 | 7.3E-01 | 4250 | 3.8E-01 |
| 320 | 4.1E-01 | 620 | 1.2E-03 | 920 | 3.6E-01 | 1300 | 2.2E-01 | 2800 | 6.6E-01 | 4300 | 3.4E-01 |
| 330 | 6.6E-01 | 630 | 9.3E-04 | 930 | 3.7E-01 | 1350 | 2.5E-01 | 2850 | 6.5E-01 | 4350 | 3.0E-01 |
| 340 | 8.1E-01 | 640 | 6.4E-04 | 940 | 3.8E-01 | 1400 | 2.8E-01 | 2900 | 6.5E-01 | 4400 | 2.5E-01 |
| 350 | 8.9E-01 | 650 | 7.6E-04 | 950 | 3.9E-01 | 1450 | 2.5E-01 | 2950 | 6.4E-01 | 4450 | 2.0E-01 |
| 360 | 9.3E-01 | 660 | 2.0E-03 | 960 | 3.9E-01 | 1500 | 2.3E-01 | 3000 | 6.3E-01 | 4500 | 1.5E-01 |
| 370 | 9.5E-01 | 670 | 8.0E-03 | 970 | 4.0E-01 | 1550 | 2.4E-01 | 3050 | 6.1E-01 | 4550 | 1.1E-01 |
| 380 | 9.6E-01 | 680 | 3.8E-02 | 980 | 4.1E-01 | 1600 | 2.8E-01 | 3100 | 5.9E-01 | 4600 | 7.8E-02 |
| 390 | 9.7E-01 | 690 | 1.2E-01 | 990 | 4.2E-01 | 1650 | 3.0E-01 | 3150 | 5.6E-01 | 4650 | 5.5E-02 |
| 400 | 9.6E-01 | 700 | 2.2E-01 | 1000 | 4.3E-01 | 1700 | 3.0E-01 | 3200 | 5.3E-01 | 4700 | 4.0E-02 |
| 410 | 9.4E-01 | 710 | 2.9E-01 | 1010 | 4.3E-01 | 1750 | 2.9E-01 | 3250 | 5.1E-01 | 4750 | 3.3E-02 |
| 420 | 9.3E-01 | 720 | 3.1E-01 | 1020 | 4.4E-01 | 1800 | 3.1E-01 | 3300 | 4.8E-01 | 4800 | 3.0E-02 |
| 430 | 9.0E-01 | 730 | 3.2E-01 | 1030 | 4.4E-01 | 1850 | 3.7E-01 | 3350 | 4.6E-01 | 4850 | 2.9E-02 |
| 440 | 8.6E-01 | 740 | 3.2E-01 | 1040 | 4.5E-01 | 1900 | 4.4E-01 | 3400 | 4.4E-01 | 4900 | 2.6E-02 |
| 450 | 8.1E-01 | 750 | 3.2E-01 | 1050 | 4.5E-01 | 1950 | 5.1E-01 | 3450 | 4.3E-01 | 4950 | 2.0E-02 |
| 460 | 7.4E-01 | 760 | 3.1E-01 | 1060 | 4.5E-01 | 2000 | 5.8E-01 | 3500 | 4.2E-01 | 5000 | 1.1E-02 |
| 470 | 6.2E-01 | 770 | 3.1E-01 | 1070 | 4.5E-01 | 2050 | 6.3E-01 | 3550 | 4.2E-01 | 5050 | 5.2E-03 |
| 480 | 4.6E-01 | 780 | 3.1E-01 | 1080 | 4.5E-01 | 2100 | 6.7E-01 | 3600 | 4.2E-01 | 5100 | 2.2E-03 |
| 490 | 2.9E-01 | 790 | 3.0E-01 | 1090 | 4.4E-01 | 2150 | 7.1E-01 | 3650 | 4.2E-01 | 5150 | 9.4E-04 |

# Data Sheet

SCHOTT

## BG38

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (350 nm) | ≥ | 0.80 |
| τi (405 nm) | ≥ | 0.93 |
| τi (514 nm) | ≥ | 0.95 |
| τi (633 nm) | ≤ | 0.67 |
| τi (694 nm) | ≤ | 0.32 |
| τi (1060 nm) | ≤ | 0.06 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 404.7 | Hg | 1.54 |
| 587.6 | He | 1.53 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.66 |

| Bubble content | |
|---|---|
| Bubble class | 2 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 2.0 |
| AR class | 2.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 482 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.5 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 8.9 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |

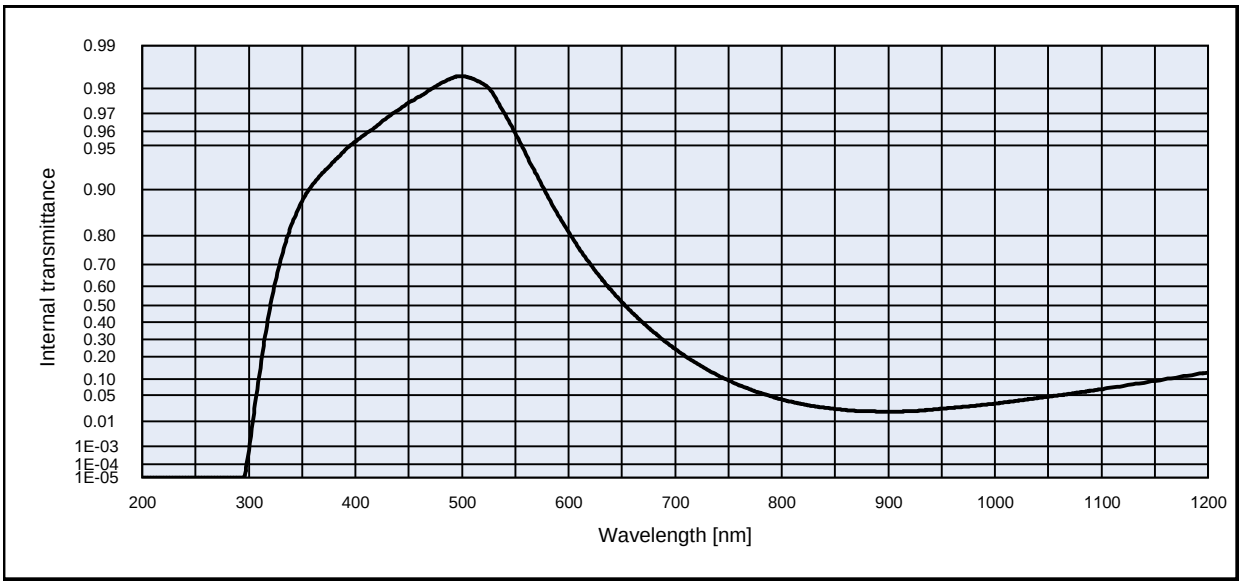
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Band pass filter / short pass filter |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.413 | 0.384 | 0.360 |
| y | 0.419 | 0.427 | 0.433 |
| Y | 80 | 71 | 64 |
| $\lambda_d$ [nm] | 501 | 500 | 500 |
| $P_e$ | 0.08 | 0.14 | 0.20 |

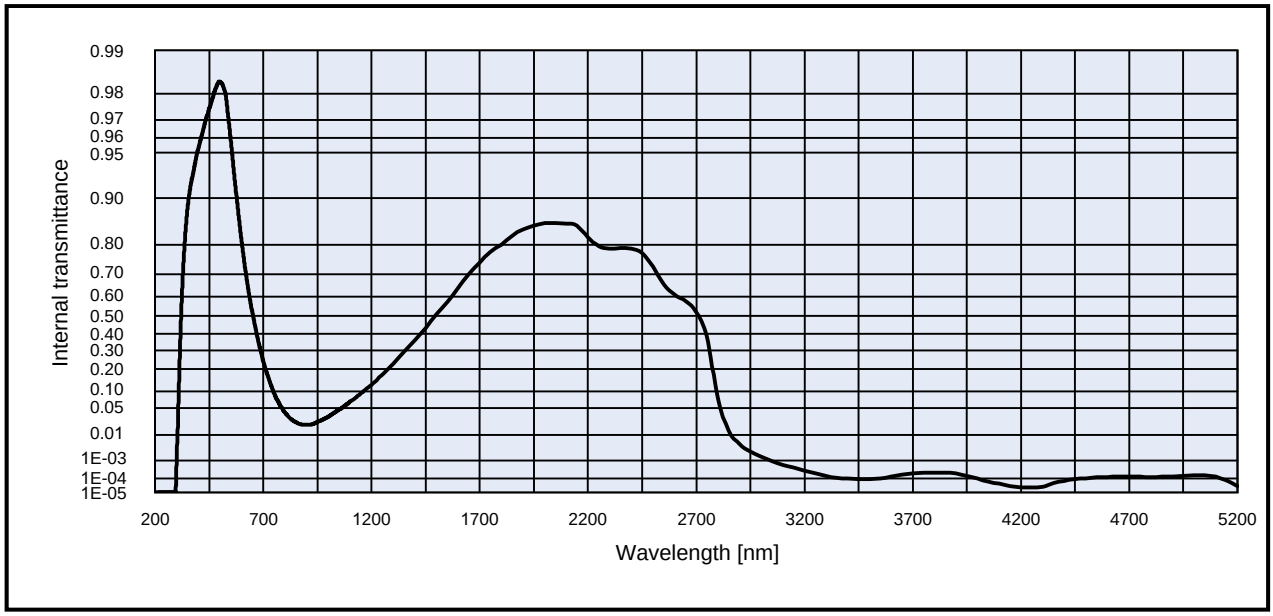
| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.390 | 0.362 | 0.339 |
| y | 0.407 | 0.413 | 0.417 |
| Y | 80 | 72 | 65 |
| $\lambda_d$ [nm] | 499 | 498 | 498 |
| $P_e$ | 0.08 | 0.15 | 0.21 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.288 | 0.268 | 0.253 |
| y | 0.328 | 0.326 | 0.323 |
| Y | 83 | 76 | 71 |
| $\lambda_d$ [nm] | 491 | 491 | 490 |
| $P_e$ | 0.09 | 0.16 | 0.22 |



# BG38

SCHOTT




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.8E-01 | 800 | 4.0E-02 | 1100 | 6.6E-02 | 2200 | 8.2E-01 | 3700 | 2.0E-04 |
| 210 | < 1.0E-05 | 510 | 9.8E-01 | 810 | 3.5E-02 | 1110 | 7.1E-02 | 2250 | 8.0E-01 | 3750 | 2.3E-04 |
| 220 | < 1.0E-05 | 520 | 9.8E-01 | 820 | 3.1E-02 | 1120 | 7.5E-02 | 2300 | 7.9E-01 | 3800 | 2.3E-04 |
| 230 | < 1.0E-05 | 530 | 9.8E-01 | 830 | 2.8E-02 | 1130 | 8.1E-02 | 2350 | 7.9E-01 | 3850 | 2.2E-04 |
| 240 | < 1.0E-05 | 540 | 9.7E-01 | 840 | 2.5E-02 | 1140 | 8.6E-02 | 2400 | 7.9E-01 | 3900 | 2.0E-04 |
| 250 | < 1.0E-05 | 550 | 9.6E-01 | 850 | 2.3E-02 | 1150 | 9.3E-02 | 2450 | 7.8E-01 | 3950 | 1.4E-04 |
| 260 | < 1.0E-05 | 560 | 9.4E-01 | 860 | 2.2E-02 | 1160 | 9.9E-02 | 2500 | 7.3E-01 | 4000 | 1.0E-04 |
| 270 | < 1.0E-05 | 570 | 9.2E-01 | 870 | 2.1E-02 | 1170 | 1.0E-01 | 2550 | 6.6E-01 | 4050 | 6.5E-05 |
| 280 | < 1.0E-05 | 580 | 8.9E-01 | 880 | 2.0E-02 | 1180 | 1.1E-01 | 2600 | 6.1E-01 | 4100 | 4.4E-05 |
| 290 | < 1.0E-05 | 590 | 8.5E-01 | 890 | 2.0E-02 | 1190 | 1.2E-01 | 2650 | 5.8E-01 | 4150 | 3.1E-05 |
| 300 | 6.5E-04 | 600 | 8.1E-01 | 900 | 2.0E-02 | 1200 | 1.3E-01 | 2700 | 5.2E-01 | 4200 | 2.5E-05 |
| 310 | 1.1E-01 | 610 | 7.6E-01 | 910 | 2.0E-02 | 1250 | 1.7E-01 | 2750 | 3.9E-01 | 4250 | 2.4E-05 |
| 320 | 4.9E-01 | 620 | 7.0E-01 | 920 | 2.0E-02 | 1300 | 2.3E-01 | 2800 | 8.0E-02 | 4300 | 2.8E-05 |
| 330 | 7.2E-01 | 630 | 6.4E-01 | 930 | 2.1E-02 | 1350 | 2.9E-01 | 2850 | 1.4E-02 | 4350 | 5.0E-05 |
| 340 | 8.3E-01 | 640 | 5.8E-01 | 940 | 2.2E-02 | 1400 | 3.6E-01 | 2900 | 5.0E-03 | 4400 | 6.8E-05 |
| 350 | 8.8E-01 | 650 | 5.2E-01 | 950 | 2.4E-02 | 1450 | 4.3E-01 | 2950 | 2.5E-03 | 4450 | 9.0E-05 |
| 360 | 9.1E-01 | 660 | 4.6E-01 | 960 | 2.5E-02 | 1500 | 5.1E-01 | 3000 | 1.5E-03 | 4500 | 1.0E-04 |
| 370 | 9.2E-01 | 670 | 4.0E-01 | 970 | 2.7E-02 | 1550 | 5.8E-01 | 3050 | 9.3E-04 | 4550 | 1.2E-04 |
| 380 | 9.4E-01 | 680 | 3.4E-01 | 980 | 2.8E-02 | 1600 | 6.4E-01 | 3100 | 6.0E-04 | 4600 | 1.2E-04 |
| 390 | 9.5E-01 | 690 | 2.9E-01 | 990 | 3.0E-02 | 1650 | 7.0E-01 | 3150 | 4.2E-04 | 4650 | 1.3E-04 |
| 400 | 9.5E-01 | 700 | 2.4E-01 | 1000 | 3.2E-02 | 1700 | 7.4E-01 | 3200 | 3.0E-04 | 4700 | 1.3E-04 |
| 410 | 9.6E-01 | 710 | 2.0E-01 | 1010 | 3.4E-02 | 1750 | 7.8E-01 | 3250 | 2.1E-04 | 4750 | 1.3E-04 |
| 420 | 9.6E-01 | 720 | 1.7E-01 | 1020 | 3.7E-02 | 1800 | 8.0E-01 | 3300 | 1.4E-04 | 4800 | 1.3E-04 |
| 430 | 9.7E-01 | 730 | 1.4E-01 | 1030 | 4.0E-02 | 1850 | 8.2E-01 | 3350 | 1.1E-04 | 4850 | 1.3E-04 |
| 440 | 9.7E-01 | 740 | 1.2E-01 | 1040 | 4.3E-02 | 1900 | 8.4E-01 | 3400 | 1.0E-04 | 4900 | 1.3E-04 |
| 450 | 9.7E-01 | 750 | 9.5E-02 | 1050 | 4.6E-02 | 1950 | 8.5E-01 | 3450 | 9.1E-05 | 4950 | 1.4E-04 |
| 460 | 9.8E-01 | 760 | 7.8E-02 | 1060 | 4.9E-02 | 2000 | 8.5E-01 | 3500 | 9.5E-05 | 5000 | 1.6E-04 |
| 470 | 9.8E-01 | 770 | 6.6E-02 | 1070 | 5.3E-02 | 2050 | 8.5E-01 | 3550 | 1.1E-04 | 5050 | 1.5E-04 |
| 480 | 9.8E-01 | 780 | 5.5E-02 | 1080 | 5.7E-02 | 2100 | 8.5E-01 | 3600 | 1.4E-04 | 5100 | 1.3E-04 |
| 490 | 9.8E-01 | 790 | 4.7E-02 | 1090 | 6.1E-02 | 2150 | 8.5E-01 | 3650 | 1.7E-04 | 5150 | 7.5E-05 |

# Data Sheet

SCHOTT

## BG39

| Reflection factor | |
|---|---|
| $P_d$ | 0.91 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (350 nm) | ≥ | 0.60 |
| τi (405 nm) | ≥ | 0.85 |
| τi (514 nm) | ≥ | 0.93 |
| τi (633 nm) | ≤ | 0.30 |
| τi (694 nm) | ≤ | 0.03 |
| τi (1060 nm) | ≤ | 0.001 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 404.7 | Hg | 1.55 |
| 587.6 | He | 1.54 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.74 |

| Bubble content | |
|---|---|
| Bubble class | 2 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 5.1 |
| AR class | 3.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 322 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 11.6 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | 13.1 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |

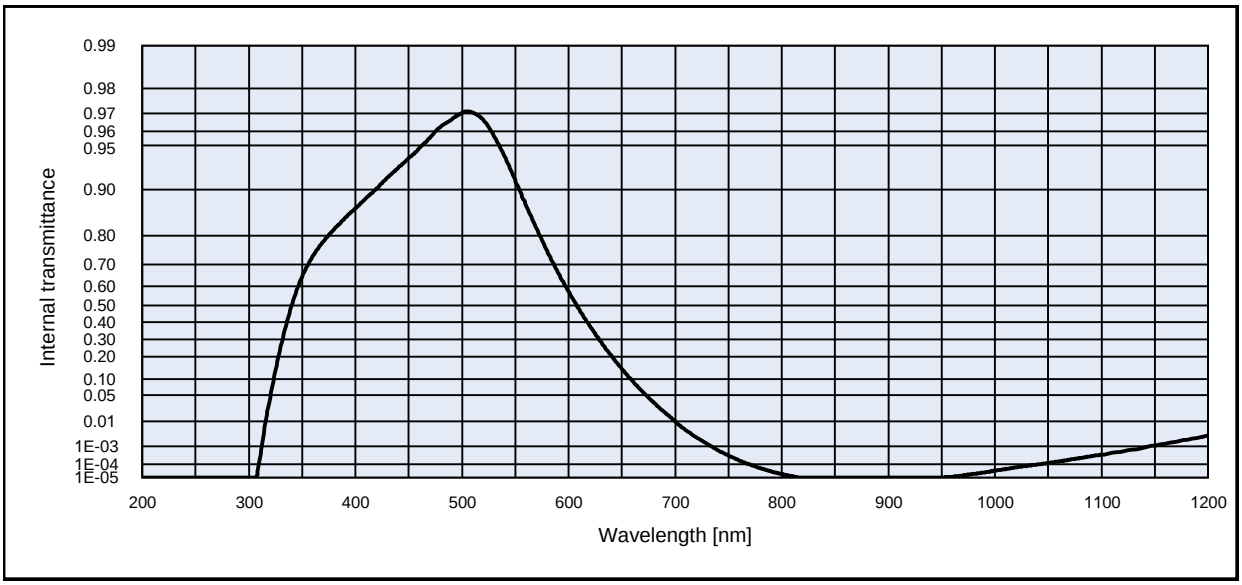
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Band pass filter / short pass filter |
| |
| |
| |
| [!!] |
| Long-term changes in the polished |
| surface are possible |
| |
| |
| |
| |
| |
| |
| |
| |
| **All data without tolerances are to be** |
| **understood to be reference values.** |
| **Guaranteed values are only those** |
| **values listed in the section** |
| **"Spectral values guaranteed".** |

**Colorimetric evaluation**

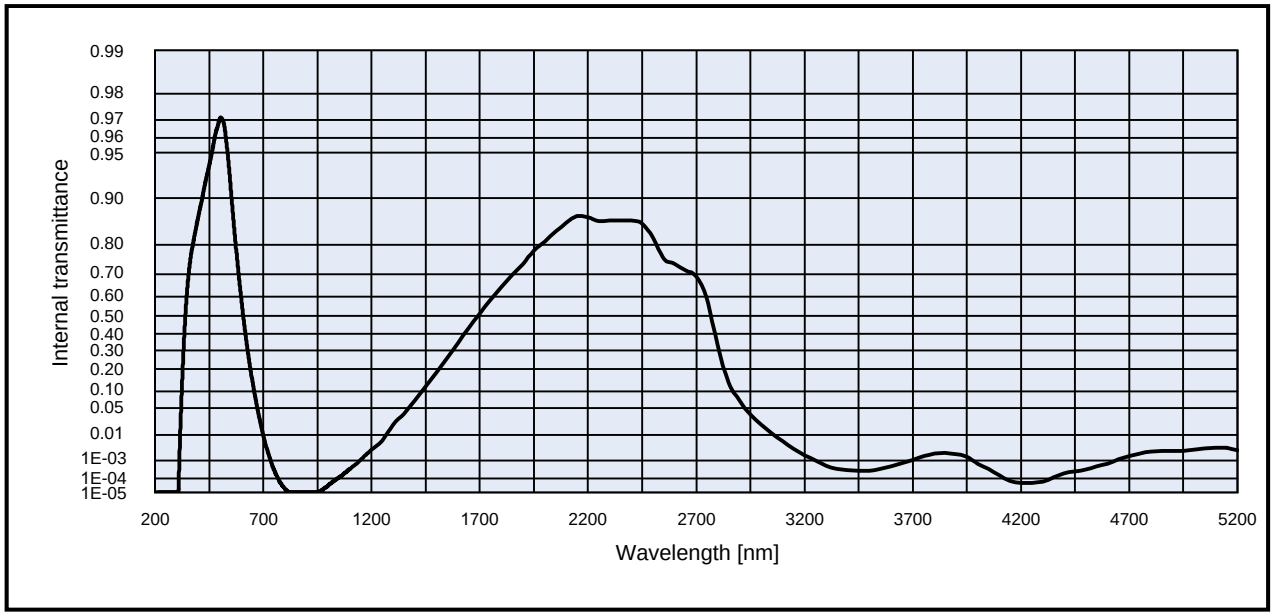
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.365 | 0.314 | 0.279 |
| y | 0.434 | 0.445 | 0.450 |
| Y | 66 | 53 | 45 |
| $\lambda_d$ [nm] | 500 | 500 | 499 |
| $P_e$ | 0.19 | 0.31 | 0.39 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.344 | 0.296 | 0.264 |
| y | 0.419 | 0.425 | 0.427 |
| Y | 67 | 55 | 47 |
| $\lambda_d$ [nm] | 498 | 498 | 497 |
| $P_e$ | 0.19 | 0.31 | 0.39 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.257 | 0.226 | 0.207 |
| y | 0.326 | 0.322 | 0.318 |
| Y | 73 | 62 | 55 |
| $\lambda_d$ [nm] | 491 | 490 | 490 |
| $P_e$ | 0.21 | 0.32 | 0.39 |



# BG39




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.7E-01 | 800 | 1.9E-05 | 1100 | 3.7E-04 | 2200 | 8.7E-01 | 3700 | 1.1E-03 |
| 210 | < 1.0E-05 | 510 | 9.7E-01 | 810 | 1.3E-05 | 1110 | 4.6E-04 | 2250 | 8.6E-01 | 3750 | 1.6E-03 |
| 220 | < 1.0E-05 | 520 | 9.7E-01 | 820 | < 1.0E-05 | 1120 | 5.5E-04 | 2300 | 8.6E-01 | 3800 | 2.1E-03 |
| 230 | < 1.0E-05 | 530 | 9.6E-01 | 830 | < 1.0E-05 | 1130 | 7.0E-04 | 2350 | 8.6E-01 | 3850 | 2.2E-03 |
| 240 | < 1.0E-05 | 540 | 9.4E-01 | 840 | < 1.0E-05 | 1140 | 8.8E-04 | 2400 | 8.6E-01 | 3900 | 1.9E-03 |
| 250 | < 1.0E-05 | 550 | 9.1E-01 | 850 | < 1.0E-05 | 1150 | 1.1E-03 | 2450 | 8.5E-01 | 3950 | 1.5E-03 |
| 260 | < 1.0E-05 | 560 | 8.7E-01 | 860 | < 1.0E-05 | 1160 | 1.3E-03 | 2500 | 8.2E-01 | 4000 | 7.0E-04 |
| 270 | < 1.0E-05 | 570 | 8.2E-01 | 870 | < 1.0E-05 | 1170 | 1.7E-03 | 2550 | 7.6E-01 | 4050 | 3.8E-04 |
| 280 | < 1.0E-05 | 580 | 7.5E-01 | 880 | < 1.0E-05 | 1180 | 2.0E-03 | 2600 | 7.4E-01 | 4100 | 1.7E-04 |
| 290 | < 1.0E-05 | 590 | 6.7E-01 | 890 | < 1.0E-05 | 1190 | 2.4E-03 | 2650 | 7.1E-01 | 4150 | 7.0E-05 |
| 300 | < 1.0E-05 | 600 | 5.8E-01 | 900 | < 1.0E-05 | 1200 | 3.1E-03 | 2700 | 6.9E-01 | 4200 | 5.2E-05 |
| 310 | 1.5E-04 | 610 | 4.8E-01 | 910 | < 1.0E-05 | 1250 | 6.6E-03 | 2750 | 5.9E-01 | 4250 | 5.0E-05 |
| 320 | 4.2E-02 | 620 | 3.8E-01 | 920 | < 1.0E-05 | 1300 | 2.0E-02 | 2800 | 3.3E-01 | 4300 | 6.0E-05 |
| 330 | 2.6E-01 | 630 | 2.9E-01 | 930 | < 1.0E-05 | 1350 | 3.8E-02 | 2850 | 1.4E-01 | 4350 | 1.2E-04 |
| 340 | 4.9E-01 | 640 | 2.1E-01 | 940 | < 1.0E-05 | 1400 | 7.0E-02 | 2900 | 7.0E-02 | 4400 | 2.0E-04 |
| 350 | 6.5E-01 | 650 | 1.4E-01 | 950 | 1.0E-05 | 1450 | 1.2E-01 | 2950 | 3.6E-02 | 4450 | 2.8E-04 |
| 360 | 7.3E-01 | 660 | 9.2E-02 | 960 | 1.2E-05 | 1500 | 1.8E-01 | 3000 | 2.0E-02 | 4500 | 3.4E-04 |
| 370 | 7.8E-01 | 670 | 5.7E-02 | 970 | 1.5E-05 | 1550 | 2.6E-01 | 3050 | 1.1E-02 | 4550 | 5.0E-04 |
| 380 | 8.2E-01 | 680 | 3.4E-02 | 980 | 1.9E-05 | 1600 | 3.4E-01 | 3100 | 6.0E-03 | 4600 | 7.0E-04 |
| 390 | 8.5E-01 | 690 | 1.9E-02 | 990 | 2.6E-05 | 1650 | 4.3E-01 | 3150 | 3.1E-03 | 4650 | 1.1E-03 |
| 400 | 8.7E-01 | 700 | 1.0E-02 | 1000 | 3.4E-05 | 1700 | 5.1E-01 | 3200 | 1.7E-03 | 4700 | 1.6E-03 |
| 410 | 8.9E-01 | 710 | 5.0E-03 | 1010 | 4.5E-05 | 1750 | 5.9E-01 | 3250 | 9.6E-04 | 4750 | 2.0E-03 |
| 420 | 9.0E-01 | 720 | 2.6E-03 | 1020 | 5.9E-05 | 1800 | 6.5E-01 | 3300 | 5.6E-04 | 4800 | 2.5E-03 |
| 430 | 9.2E-01 | 730 | 1.3E-03 | 1030 | 7.5E-05 | 1850 | 7.0E-01 | 3350 | 3.9E-04 | 4850 | 2.6E-03 |
| 440 | 9.3E-01 | 740 | 6.5E-04 | 1040 | 9.2E-05 | 1900 | 7.4E-01 | 3400 | 3.1E-04 | 4900 | 2.6E-03 |
| 450 | 9.4E-01 | 750 | 3.3E-04 | 1050 | 1.2E-04 | 1950 | 7.8E-01 | 3450 | 2.9E-04 | 4950 | 2.6E-03 |
| 460 | 9.5E-01 | 760 | 1.7E-04 | 1060 | 1.5E-04 | 2000 | 8.1E-01 | 3500 | 3.0E-04 | 5000 | 3.0E-03 |
| 470 | 9.6E-01 | 770 | 9.3E-05 | 1070 | 1.8E-04 | 2050 | 8.4E-01 | 3550 | 3.6E-04 | 5050 | 3.3E-03 |
| 480 | 9.6E-01 | 780 | 5.1E-05 | 1080 | 2.3E-04 | 2100 | 8.6E-01 | 3600 | 5.1E-04 | 5100 | 3.6E-03 |
| 490 | 9.7E-01 | 790 | 3.0E-05 | 1090 | 3.0E-04 | 2150 | 8.7E-01 | 3650 | 7.4E-04 | 5150 | 3.5E-03 |

# Data Sheet

SCHOTT

## BG40

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (350 nm) | ≥ | 0.80 |
| τi (405 nm) | ≥ | 0.93 |
| τi (514 nm) | ≥ | 0.97 |
| τi (633 nm) | ≤ | 0.57 |
| τi (694 nm) | ≤ | 0.16 |
| τi (1060 nm) | ≤ | 0.02 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 404.7 | Hg | 1.54 |
| 587.6 | He | 1.53 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.74 |

| Bubble content | |
|---|---|
| Bubble class | 2 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 5.1 |
| AR class | 3.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 313 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 11.9 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | 13.7 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |

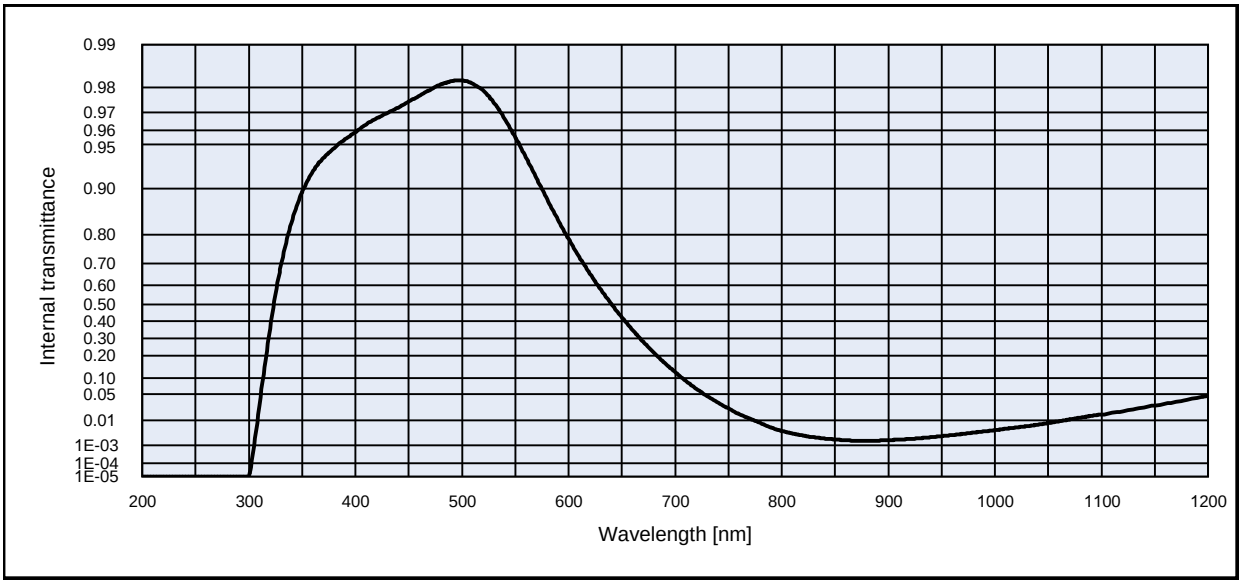
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Band pass filter / short pass filter |
| |
| |
| |
| [!] |
| Long-term changes in the polished |
| surface are possible under some |
| circumstances |
| |
| |
| |
| |
| |
| |
| |
| **All data without tolerances are to be** |
| **understood to be reference values.** |
| **Guaranteed values are only those** |
| **values listed in the section** |
| **"Spectral values guaranteed".** |

**Colorimetric evaluation**

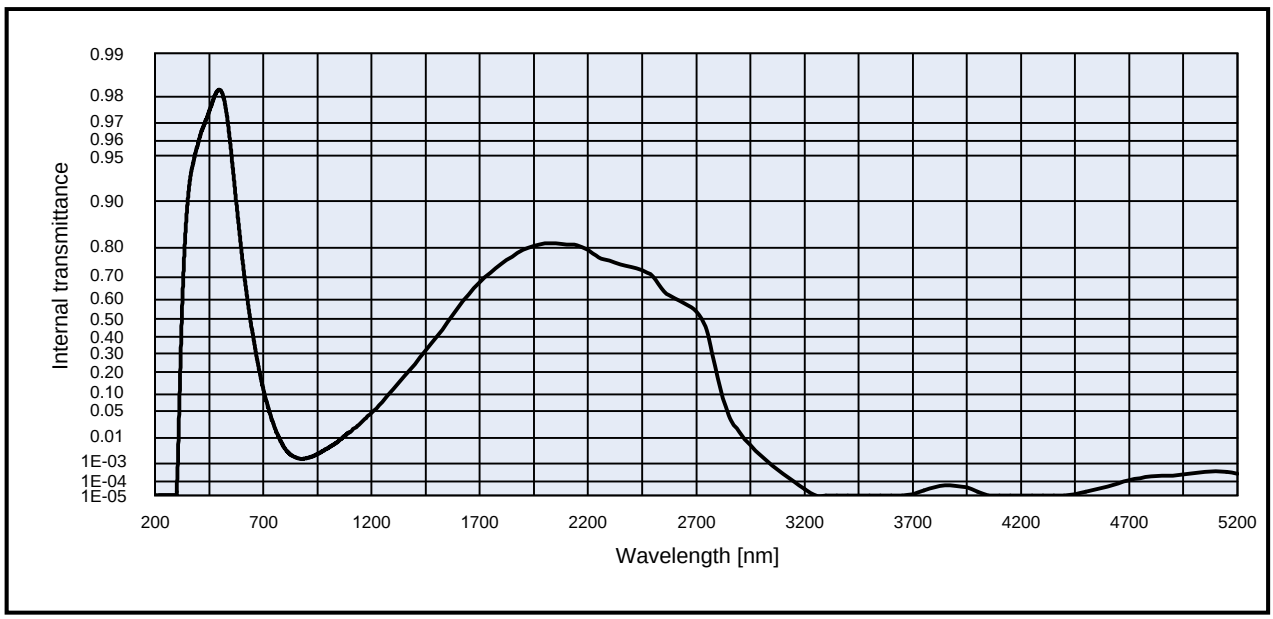
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.406 | 0.374 | 0.348 |
| y | 0.421 | 0.430 | 0.436 |
| Y | 78 | 68 | 61 |
| $\lambda_d$ [nm] | 501 | 500 | 500 |
| $P_e$ | 0.09 | 0.17 | 0.23 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.383 | 0.352 | 0.327 |
| y | 0.409 | 0.415 | 0.419 |
| Y | 79 | 70 | 63 |
| $\lambda_d$ [nm] | 499 | 498 | 498 |
| $P_e$ | 0.10 | 0.17 | 0.23 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.283 | 0.262 | 0.246 |
| y | 0.327 | 0.324 | 0.321 |
| Y | 82 | 75 | 69 |
| $\lambda_d$ [nm] | 491 | 490 | 490 |
| $P_e$ | 0.11 | 0.19 | 0.25 |



# BG40




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.8E-01 | 800 | 4.3E-03 | 1100 | 1.5E-02 | 2200 | 7.9E-01 | 3700 | 1.2E-05 |
| 210 | < 1.0E-05 | 510 | 9.8E-01 | 810 | 3.4E-03 | 1110 | 1.7E-02 | 2250 | 7.7E-01 | 3750 | 2.5E-05 |
| 220 | < 1.0E-05 | 520 | 9.8E-01 | 820 | 2.8E-03 | 1120 | 1.9E-02 | 2300 | 7.6E-01 | 3800 | 4.2E-05 |
| 230 | < 1.0E-05 | 530 | 9.7E-01 | 830 | 2.3E-03 | 1130 | 2.1E-02 | 2350 | 7.5E-01 | 3850 | 5.4E-05 |
| 240 | < 1.0E-05 | 540 | 9.7E-01 | 840 | 2.1E-03 | 1140 | 2.4E-02 | 2400 | 7.4E-01 | 3900 | 5.3E-05 |
| 250 | < 1.0E-05 | 550 | 9.6E-01 | 850 | 1.9E-03 | 1150 | 2.7E-02 | 2450 | 7.3E-01 | 3950 | 4.3E-05 |
| 260 | < 1.0E-05 | 560 | 9.4E-01 | 860 | 1.7E-03 | 1160 | 3.1E-02 | 2500 | 7.0E-01 | 4000 | 2.0E-05 |
| 270 | < 1.0E-05 | 570 | 9.2E-01 | 870 | 1.6E-03 | 1170 | 3.3E-02 | 2550 | 6.4E-01 | 4050 | < 1.0E-05 |
| 280 | < 1.0E-05 | 580 | 8.8E-01 | 880 | 1.6E-03 | 1180 | 3.7E-02 | 2600 | 6.1E-01 | 4100 | < 1.0E-05 |
| 290 | < 1.0E-05 | 590 | 8.4E-01 | 890 | 1.7E-03 | 1190 | 4.1E-02 | 2650 | 5.8E-01 | 4150 | < 1.0E-05 |
| 300 | < 1.0E-05 | 600 | 7.9E-01 | 900 | 1.8E-03 | 1200 | 4.6E-02 | 2700 | 5.4E-01 | 4200 | < 1.0E-05 |
| 310 | 2.6E-02 | 610 | 7.3E-01 | 910 | 1.8E-03 | 1250 | 7.5E-02 | 2750 | 4.4E-01 | 4250 | < 1.0E-05 |
| 320 | 3.6E-01 | 620 | 6.6E-01 | 920 | 2.0E-03 | 1300 | 1.2E-01 | 2800 | 1.7E-01 | 4300 | < 1.0E-05 |
| 330 | 6.9E-01 | 630 | 5.8E-01 | 930 | 2.1E-03 | 1350 | 1.8E-01 | 2850 | 4.2E-02 | 4350 | < 1.0E-05 |
| 340 | 8.3E-01 | 640 | 5.0E-01 | 940 | 2.4E-03 | 1400 | 2.4E-01 | 2900 | 1.5E-02 | 4400 | < 1.0E-05 |
| 350 | 8.9E-01 | 650 | 4.2E-01 | 950 | 2.6E-03 | 1450 | 3.2E-01 | 2950 | 5.8E-03 | 4450 | 1.3E-05 |
| 360 | 9.2E-01 | 660 | 3.5E-01 | 960 | 2.9E-03 | 1500 | 4.0E-01 | 3000 | 2.2E-03 | 4500 | 2.0E-05 |
| 370 | 9.4E-01 | 670 | 2.8E-01 | 970 | 3.2E-03 | 1550 | 4.8E-01 | 3050 | 8.1E-04 | 4550 | 3.0E-05 |
| 380 | 9.5E-01 | 680 | 2.2E-01 | 980 | 3.6E-03 | 1600 | 5.6E-01 | 3100 | 2.8E-04 | 4600 | 4.6E-05 |
| 390 | 9.5E-01 | 690 | 1.7E-01 | 990 | 4.1E-03 | 1650 | 6.3E-01 | 3150 | 9.8E-05 | 4650 | 7.4E-05 |
| 400 | 9.6E-01 | 700 | 1.2E-01 | 1000 | 4.5E-03 | 1700 | 6.8E-01 | 3200 | 3.0E-05 | 4700 | 1.2E-04 |
| 410 | 9.6E-01 | 710 | 8.9E-02 | 1010 | 5.1E-03 | 1750 | 7.2E-01 | 3250 | 1.0E-05 | 4750 | 1.6E-04 |
| 420 | 9.7E-01 | 720 | 6.4E-02 | 1020 | 5.7E-03 | 1800 | 7.5E-01 | 3300 | < 1.0E-05 | 4800 | 2.0E-04 |
| 430 | 9.7E-01 | 730 | 4.6E-02 | 1030 | 6.4E-03 | 1850 | 7.7E-01 | 3350 | < 1.0E-05 | 4850 | 2.3E-04 |
| 440 | 9.7E-01 | 740 | 3.2E-02 | 1040 | 7.1E-03 | 1900 | 7.9E-01 | 3400 | < 1.0E-05 | 4900 | 2.3E-04 |
| 450 | 9.7E-01 | 750 | 2.3E-02 | 1050 | 8.2E-03 | 1950 | 8.0E-01 | 3450 | < 1.0E-05 | 4950 | 2.6E-04 |
| 460 | 9.8E-01 | 760 | 1.6E-02 | 1060 | 9.4E-03 | 2000 | 8.1E-01 | 3500 | < 1.0E-05 | 5000 | 3.1E-04 |
| 470 | 9.8E-01 | 770 | 1.1E-02 | 1070 | 1.1E-02 | 2050 | 8.1E-01 | 3550 | < 1.0E-05 | 5050 | 3.8E-04 |
| 480 | 9.8E-01 | 780 | 8.3E-03 | 1080 | 1.2E-02 | 2100 | 8.1E-01 | 3600 | < 1.0E-05 | 5100 | 4.0E-04 |
| 490 | 9.8E-01 | 790 | 5.7E-03 | 1090 | 1.4E-02 | 2150 | 8.1E-01 | 3650 | < 1.0E-05 | 5150 | 3.8E-04 |

# Data Sheet

SCHOTT

## BG42

| Density | |
|---|---|
| ρ [g/cm³] | 2.69 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.91 |

| Bubble content | |
|---|---|
| Bubble class | 2 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 2.0 |
| AR class | 2.0 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (350 nm) | ≥ | 0.40 |
| τi (405 nm) | ≥ | 0.65 |
| τi (514 nm) | ≥ | 0.88 |
| τi (633 nm) | ≤ | 0.27 |
| τi (694 nm) | ≤ | 0.03 |
| τi (1060 nm) | ≤ | 0.002 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 475 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.3 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 8.7 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 405 | Hg | 1.55 |
| 588 | He | 1.54 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |

**Notes**

Ionically colored glass

Band pass filter / short pass filter

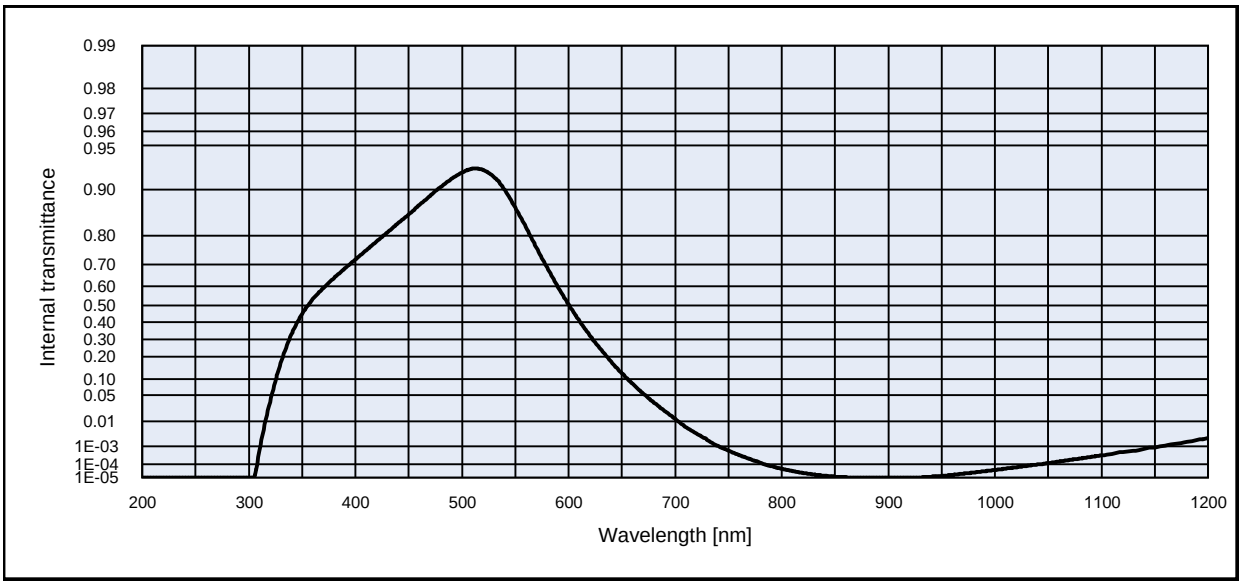
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

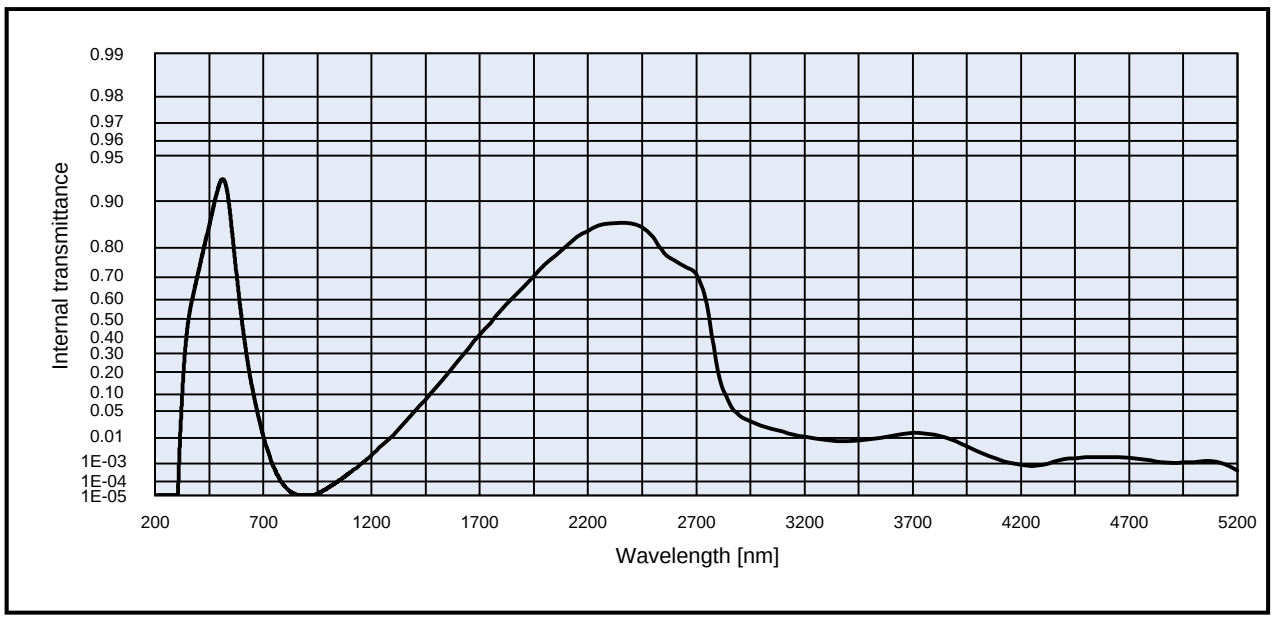
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.359 | 0.305 | 0.270 |
| y | 0.439 | 0.456 | 0.466 |
| Y | 61 | 47 | 38 |
| $\lambda_d$ [nm] | 501 | 501 | 501 |
| $P_e$ | 0.20 | 0.32 | 0.40 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.338 | 0.288 | 0.256 |
| y | 0.424 | 0.437 | 0.445 |
| Y | 63 | 48 | 39 |
| $\lambda_d$ [nm] | 499 | 499 | 499 |
| $P_e$ | 0.21 | 0.33 | 0.41 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.254 | 0.222 | 0.203 |
| y | 0.332 | 0.334 | 0.337 |
| Y | 68 | 55 | 46 |
| $\lambda_d$ [nm] | 492 | 492 | 492 |
| $P_e$ | 0.21 | 0.33 | 0.39 |



# BG42




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.2E-01 | 800 | 4.7E-05 | 1100 | 3.3E-04 | 2200 | 8.4E-01 | 3700 | 1.4E-02 |
| 210 | < 1.0E-05 | 510 | 9.3E-01 | 810 | 3.3E-05 | 1110 | 4.1E-04 | 2250 | 8.6E-01 | 3750 | 1.4E-02 |
| 220 | < 1.0E-05 | 520 | 9.3E-01 | 820 | 2.3E-05 | 1120 | 5.0E-04 | 2300 | 8.6E-01 | 3800 | 1.2E-02 |
| 230 | < 1.0E-05 | 530 | 9.2E-01 | 830 | 1.8E-05 | 1130 | 6.0E-04 | 2350 | 8.6E-01 | 3850 | 1.0E-02 |
| 240 | < 1.0E-05 | 540 | 9.0E-01 | 840 | 1.4E-05 | 1140 | 7.7E-04 | 2400 | 8.6E-01 | 3900 | 8.0E-03 |
| 250 | < 1.0E-05 | 550 | 8.7E-01 | 850 | 1.2E-05 | 1150 | 9.0E-04 | 2450 | 8.5E-01 | 3950 | 5.2E-03 |
| 260 | < 1.0E-05 | 560 | 8.2E-01 | 860 | 1.1E-05 | 1160 | 1.1E-03 | 2500 | 8.3E-01 | 4000 | 3.3E-03 |
| 270 | < 1.0E-05 | 570 | 7.6E-01 | 870 | < 1.0E-05 | 1170 | 1.3E-03 | 2550 | 7.9E-01 | 4050 | 2.2E-03 |
| 280 | < 1.0E-05 | 580 | 6.9E-01 | 880 | < 1.0E-05 | 1180 | 1.6E-03 | 2600 | 7.6E-01 | 4100 | 1.5E-03 |
| 290 | < 1.0E-05 | 590 | 6.0E-01 | 890 | < 1.0E-05 | 1190 | 1.9E-03 | 2650 | 7.4E-01 | 4150 | 1.1E-03 |
| 300 | < 1.0E-05 | 600 | 5.1E-01 | 900 | < 1.0E-05 | 1200 | 2.3E-03 | 2700 | 7.1E-01 | 4200 | 8.4E-04 |
| 310 | 5.7E-04 | 610 | 4.1E-01 | 910 | < 1.0E-05 | 1250 | 5.7E-03 | 2750 | 5.8E-01 | 4250 | 7.4E-04 |
| 320 | 3.5E-02 | 620 | 3.2E-01 | 920 | < 1.0E-05 | 1300 | 1.2E-02 | 2800 | 2.1E-01 | 4300 | 8.4E-04 |
| 330 | 1.7E-01 | 630 | 2.4E-01 | 930 | 1.0E-05 | 1350 | 2.6E-02 | 2850 | 7.6E-02 | 4350 | 1.2E-03 |
| 340 | 3.3E-01 | 640 | 1.8E-01 | 940 | 1.2E-05 | 1400 | 5.0E-02 | 2900 | 4.0E-02 | 4400 | 1.5E-03 |
| 350 | 4.5E-01 | 650 | 1.2E-01 | 950 | 1.3E-05 | 1450 | 8.3E-02 | 2950 | 2.9E-02 | 4450 | 1.7E-03 |
| 360 | 5.3E-01 | 660 | 8.3E-02 | 960 | 1.6E-05 | 1500 | 1.3E-01 | 3000 | 2.3E-02 | 4500 | 1.9E-03 |
| 370 | 5.9E-01 | 670 | 5.4E-02 | 970 | 2.0E-05 | 1550 | 1.9E-01 | 3050 | 1.9E-02 | 4550 | 2.0E-03 |
| 380 | 6.4E-01 | 680 | 3.4E-02 | 980 | 2.5E-05 | 1600 | 2.6E-01 | 3100 | 1.5E-02 | 4600 | 2.0E-03 |
| 390 | 6.8E-01 | 690 | 2.1E-02 | 990 | 3.2E-05 | 1650 | 3.3E-01 | 3150 | 1.3E-02 | 4650 | 1.9E-03 |
| 400 | 7.2E-01 | 700 | 1.2E-02 | 1000 | 3.9E-05 | 1700 | 4.1E-01 | 3200 | 1.1E-02 | 4700 | 1.8E-03 |
| 410 | 7.5E-01 | 710 | 6.5E-03 | 1010 | 4.8E-05 | 1750 | 4.8E-01 | 3250 | 9.5E-03 | 4750 | 1.6E-03 |
| 420 | 7.8E-01 | 720 | 3.7E-03 | 1020 | 6.0E-05 | 1800 | 5.5E-01 | 3300 | 8.7E-03 | 4800 | 1.4E-03 |
| 430 | 8.1E-01 | 730 | 2.0E-03 | 1030 | 7.4E-05 | 1850 | 6.1E-01 | 3350 | 8.1E-03 | 4850 | 1.2E-03 |
| 440 | 8.3E-01 | 740 | 1.0E-03 | 1040 | 9.2E-05 | 1900 | 6.6E-01 | 3400 | 8.0E-03 | 4900 | 1.1E-03 |
| 450 | 8.5E-01 | 750 | 6.1E-04 | 1050 | 1.2E-04 | 1950 | 7.0E-01 | 3450 | 8.3E-03 | 4950 | 1.1E-03 |
| 460 | 8.7E-01 | 760 | 3.5E-04 | 1060 | 1.4E-04 | 2000 | 7.5E-01 | 3500 | 9.0E-03 | 5000 | 1.2E-03 |
| 470 | 8.9E-01 | 770 | 2.1E-04 | 1070 | 1.8E-04 | 2050 | 7.8E-01 | 3550 | 1.0E-02 | 5050 | 1.3E-03 |
| 480 | 9.0E-01 | 780 | 1.2E-04 | 1080 | 2.2E-04 | 2100 | 8.0E-01 | 3600 | 1.2E-02 | 5100 | 1.2E-03 |
| 490 | 9.2E-01 | 790 | 7.2E-05 | 1090 | 2.7E-04 | 2150 | 8.3E-01 | 3650 | 1.3E-02 | 5150 | 8.6E-04 |

# Data Sheet

SCHOTT

## BG50

| Reflection factor | |
|---|---|
| $P_d$ | 0,915 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (500 nm) | ≥ | 0,96 |
| τi (600 nm) | ≥ | 0,68 |
| τi (700 nm) | ≤ | 0,13 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 404,7 | Hg | 1,55 |
| 480,0 | Cd | 1,54 |
| 546,1 | Hg | 1,54 |
| 587,6 | He | 1,53 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2,61 |

| Bubble content | |
|---|---|
| Bubble class | 1 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 2.0 |
| AR class | 2.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 452 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7,3 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9,0 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_k$ [nm/°C] | |

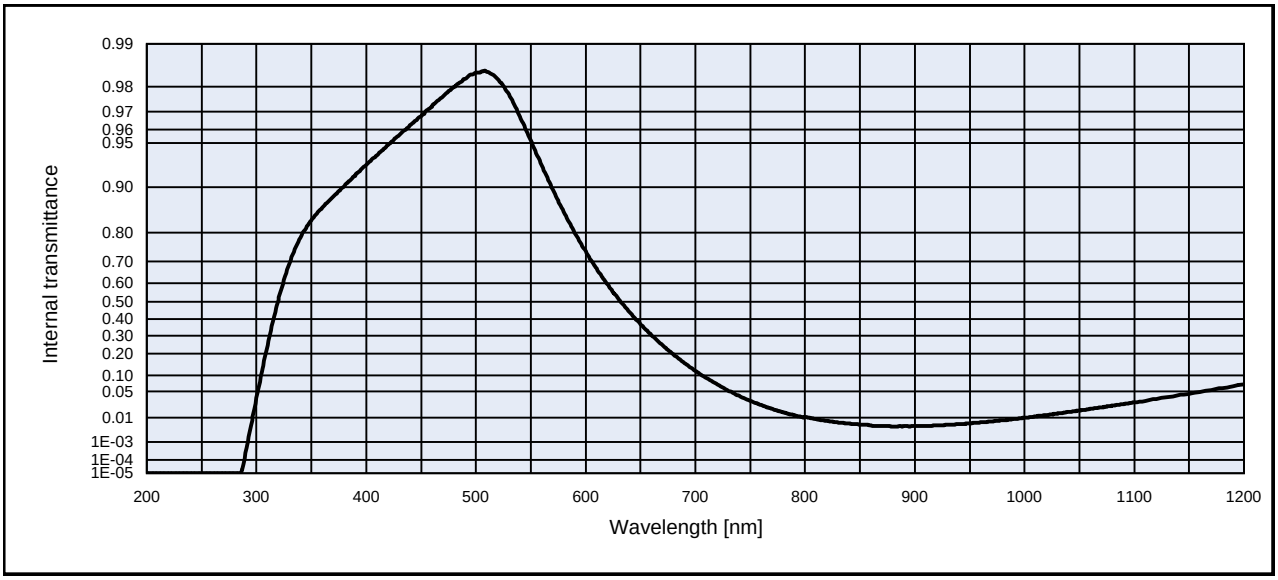
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Band pass filter / short pass filter |
| Color compensating filter / IR cut filter |
| |
| |
| |
| |
| |
| [!!] |
| protective coatings recommended |
| Long-term changes in the polished |
| surface are possible |
| |
| |
| |
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section -Spectral values guaranteed-.** |

**Colorimetric evaluation**

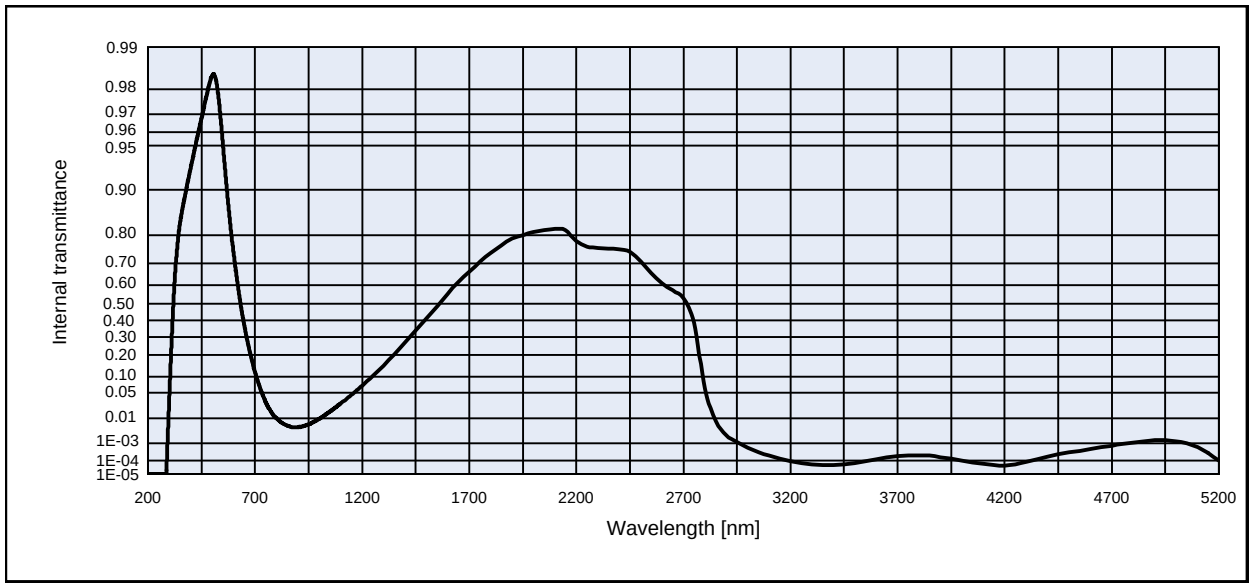
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0,398 | 0,360 | 0,331 |
| y | 0,424 | 0,435 | 0,441 |
| Y | 75 | 65 | 57 |
| $\lambda_d$ [nm] | 501 | 500 | 500 |
| $P_e$ | 0,11 | 0,20 | 0,27 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0,375 | 0,339 | 0,311 |
| y | 0,411 | 0,419 | 0,423 |
| Y | 76 | 66 | 59 |
| $\lambda_d$ [nm] | 499 | 498 | 498 |
| $P_e$ | 0,12 | 0,20 | 0,27 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0,278 | 0,254 | 0,236 |
| y | 0,328 | 0,325 | 0,323 |
| Y | 80 | 72 | 66 |
| $\lambda_d$ [nm] | 491 | 491 | 491 |
| $P_e$ | 0,13 | 0,22 | 0,29 |



# BG50




**Internal transmittance τi at reference thickness d = 1 mm**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1,0E-05 | 500 | 9,8E-01 | 800 | 1,0E-02 | 1100 | 2,7E-02 | 2200 | 7,8E-01 | 3700 | 2,0E-04 |
| 210 | < 1,0E-05 | 510 | 9,8E-01 | 810 | 8,8E-03 | 1110 | 3,0E-02 | 2250 | 7,6E-01 | 3750 | 2,1E-04 |
| 220 | < 1,0E-05 | 520 | 9,8E-01 | 820 | 7,6E-03 | 1120 | 3,3E-02 | 2300 | 7,6E-01 | 3800 | 2,1E-04 |
| 230 | < 1,0E-05 | 530 | 9,8E-01 | 830 | 6,8E-03 | 1130 | 3,7E-02 | 2350 | 7,6E-01 | 3850 | 2,1E-04 |
| 240 | < 1,0E-05 | 540 | 9,7E-01 | 840 | 6,1E-03 | 1140 | 4,0E-02 | 2400 | 7,5E-01 | 3900 | 1,7E-04 |
| 250 | < 1,0E-05 | 550 | 9,5E-01 | 850 | 5,7E-03 | 1150 | 4,4E-02 | 2450 | 7,4E-01 | 3950 | 1,3E-04 |
| 260 | < 1,0E-05 | 560 | 9,3E-01 | 860 | 5,2E-03 | 1160 | 4,8E-02 | 2500 | 7,1E-01 | 4000 | 1,0E-04 |
| 270 | < 1,0E-05 | 570 | 9,0E-01 | 870 | 4,9E-03 | 1170 | 5,3E-02 | 2550 | 6,6E-01 | 4050 | 7,7E-05 |
| 280 | < 1,0E-05 | 580 | 8,5E-01 | 880 | 4,8E-03 | 1180 | 5,8E-02 | 2600 | 6,1E-01 | 4100 | 6,0E-05 |
| 290 | 2,6E-04 | 590 | 8,0E-01 | 890 | 4,9E-03 | 1190 | 6,3E-02 | 2650 | 5,7E-01 | 4150 | 5,0E-05 |
| 300 | 3,5E-02 | 600 | 7,4E-01 | 900 | 4,9E-03 | 1200 | 6,9E-02 | 2700 | 5,3E-01 | 4200 | 4,5E-05 |
| 310 | 2,4E-01 | 610 | 6,7E-01 | 910 | 5,0E-03 | 1250 | 1,0E-01 | 2750 | 3,9E-01 | 4250 | 5,3E-05 |
| 320 | 5,1E-01 | 620 | 5,9E-01 | 920 | 5,2E-03 | 1300 | 1,5E-01 | 2800 | 6,1E-02 | 4300 | 7,9E-05 |
| 330 | 6,9E-01 | 630 | 5,2E-01 | 930 | 5,5E-03 | 1350 | 2,0E-01 | 2850 | 8,2E-03 | 4350 | 1,2E-04 |
| 340 | 7,9E-01 | 640 | 4,4E-01 | 940 | 5,9E-03 | 1400 | 2,7E-01 | 2900 | 2,3E-03 | 4400 | 1,8E-04 |
| 350 | 8,3E-01 | 650 | 3,7E-01 | 950 | 6,2E-03 | 1450 | 3,4E-01 | 2950 | 1,1E-03 | 4450 | 2,4E-04 |
| 360 | 8,6E-01 | 660 | 3,0E-01 | 960 | 6,8E-03 | 1500 | 4,1E-01 | 3000 | 5,8E-04 | 4500 | 3,2E-04 |
| 370 | 8,8E-01 | 670 | 2,4E-01 | 970 | 7,3E-03 | 1550 | 4,9E-01 | 3050 | 3,3E-04 | 4550 | 4,0E-04 |
| 380 | 9,0E-01 | 680 | 1,9E-01 | 980 | 8,0E-03 | 1600 | 5,5E-01 | 3100 | 2,0E-04 | 4600 | 4,9E-04 |
| 390 | 9,2E-01 | 690 | 1,5E-01 | 990 | 8,9E-03 | 1650 | 6,1E-01 | 3150 | 1,3E-04 | 4650 | 5,9E-04 |
| 400 | 9,3E-01 | 700 | 1,2E-01 | 1000 | 9,8E-03 | 1700 | 6,7E-01 | 3200 | 8,9E-05 | 4700 | 7,2E-04 |
| 410 | 9,4E-01 | 710 | 8,9E-02 | 1010 | 1,1E-02 | 1750 | 7,1E-01 | 3250 | 6,7E-05 | 4750 | 8,7E-04 |
| 420 | 9,5E-01 | 720 | 6,8E-02 | 1020 | 1,2E-02 | 1800 | 7,4E-01 | 3300 | 5,5E-05 | 4800 | 1,0E-03 |
| 430 | 9,6E-01 | 730 | 5,2E-02 | 1030 | 1,3E-02 | 1850 | 7,7E-01 | 3350 | 5,0E-05 | 4850 | 1,2E-03 |
| 440 | 9,6E-01 | 740 | 3,9E-02 | 1040 | 1,5E-02 | 1900 | 7,9E-01 | 3400 | 5,0E-05 | 4900 | 1,3E-03 |
| 450 | 9,7E-01 | 750 | 3,0E-02 | 1050 | 1,6E-02 | 1950 | 8,0E-01 | 3450 | 5,6E-05 | 4950 | 1,4E-03 |
| 460 | 9,7E-01 | 760 | 2,3E-02 | 1060 | 1,8E-02 | 2000 | 8,1E-01 | 3500 | 6,7E-05 | 5000 | 1,2E-03 |
| 470 | 9,8E-01 | 770 | 1,8E-02 | 1070 | 2,0E-02 | 2050 | 8,1E-01 | 3550 | 8,8E-05 | 5050 | 9,8E-04 |
| 480 | 9,8E-01 | 780 | 1,4E-02 | 1080 | 2,2E-02 | 2100 | 8,2E-01 | 3600 | 1,2E-04 | 5100 | 6,3E-04 |
| 490 | 9,8E-01 | 790 | 1,2E-02 | 1090 | 2,5E-02 | 2150 | 8,1E-01 | 3650 | 1,6E-04 | 5150 | 3,1E-04 |

# Data Sheet

SCHOTT

## BG55

| Reflection factor | |
|---|---|
| $P_d$ | 0.913 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (405 nm) | ≥ | 0,76 |
| τi (514 nm) | ≥ | 0,93 |
| τi (633 nm) | ≥ | 0,18 |
| τi (694 nm) | ≤ | 0,016 |
| τi (1060 nm) | ≤ | 0.0005 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 588.6 | He | 1.54 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.64 |

| Bubble content | |
|---|---|
| Bubble class | 2 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 2.0 |
| AR class | 2.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 453 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.2 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.1 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | - |

| Temperature coefficient | |
|---|---|
| $T_k$ [nm/°C] | |

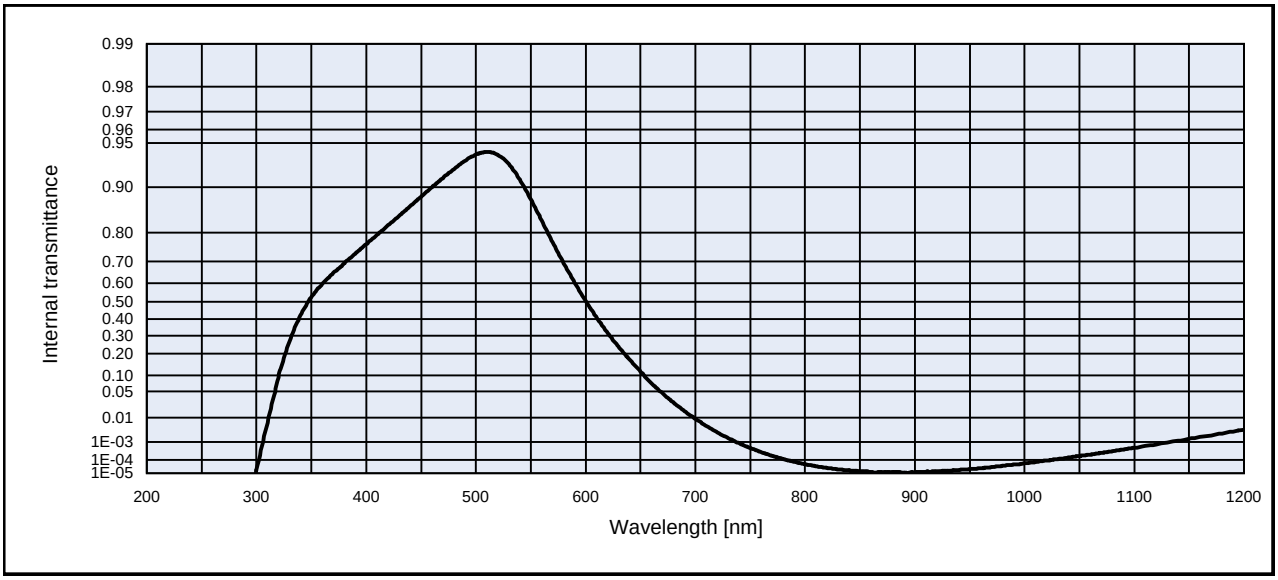
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Band pass filter / short pass filter |
| Color compensating filter / IR cut filter |
| |
| |
| |
| |
| [!!] |
| protective coatings recommended |
| Long-term changes in the polished |
| surface are possible |
| |
| CR (ISO/WD 13384) = 1 |
| |
| Knoop hardness HK (0.1/20) = 504 |
| cp = 0,83 J/gK |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section -Spectral values guaranteed-.** |

### Colorimetric evaluation

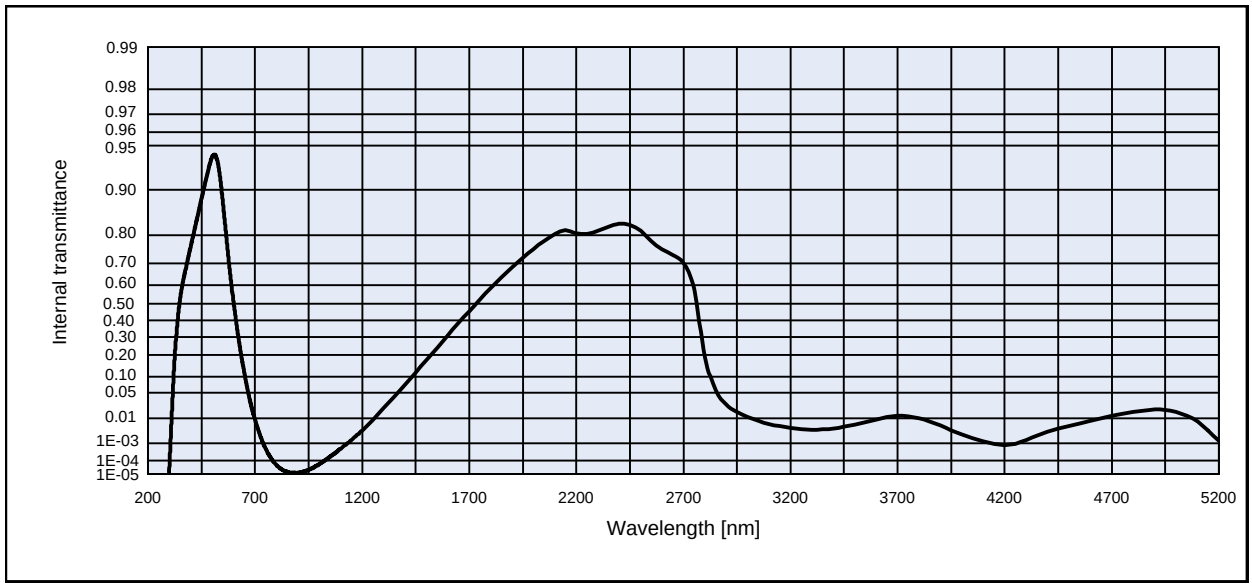
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.356 | 0.302 | 0.267 |
| y | 0.438 | 0.452 | 0.460 |
| Y | 62 | 48 | 39 |
| $\lambda_d$ [nm] | 501 | 500 | 500 |
| $P_e$ | 0.21 | 0.33 | 0.41 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.336 | 0.285 | 0.252 |
| y | 0.423 | 0.432 | 0.437 |
| Y | 63 | 49 | 41 |
| $\lambda_d$ [nm] | 499 | 498 | 498 |
| $P_e$ | 0.21 | 0.34 | 0.42 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.252 | 0.220 | 0.201 |
| y | 0.329 | 0.328 | 0.328 |
| Y | 69 | 57 | 48 |
| $\lambda_d$ [nm] | 492 | 491 | 491 |
| $P_e$ | 0.22 | 0.34 | 0.41 |



# BG55




**Internal transmittance τi at reference thickness d = 1 mm**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.4E-01 | 800 | 4.9E-05 | 1100 | 5.1E-04 | 2200 | 8.0E-01 | 3700 | 1.2E-02 |
| 210 | < 1.0E-05 | 510 | 9.4E-01 | 810 | 3.5E-05 | 1110 | 6.3E-04 | 2250 | 8.0E-01 | 3750 | 1.1E-02 |
| 220 | < 1.0E-05 | 520 | 9.4E-01 | 820 | 2.7E-05 | 1120 | 7.6E-04 | 2300 | 8.1E-01 | 3800 | 9.9E-03 |
| 230 | < 1.0E-05 | 530 | 9.3E-01 | 830 | 2.1E-05 | 1130 | 9.4E-04 | 2350 | 8.2E-01 | 3850 | 8.1E-03 |
| 240 | < 1.0E-05 | 540 | 9.1E-01 | 840 | 1.7E-05 | 1140 | 1.2E-03 | 2400 | 8.3E-01 | 3900 | 5.6E-03 |
| 250 | < 1.0E-05 | 550 | 8.8E-01 | 850 | 1.5E-05 | 1150 | 1.4E-03 | 2450 | 8.3E-01 | 3950 | 3.7E-03 |
| 260 | < 1.0E-05 | 560 | 8.3E-01 | 860 | 1.2E-05 | 1160 | 1.7E-03 | 2500 | 8.1E-01 | 4000 | 2.6E-03 |
| 270 | < 1.0E-05 | 570 | 7.7E-01 | 870 | 1.2E-05 | 1170 | 2.1E-03 | 2550 | 7.8E-01 | 4050 | 1.7E-03 |
| 280 | < 1.0E-05 | 580 | 6.9E-01 | 880 | 1.2E-05 | 1180 | 2.5E-03 | 2600 | 7.5E-01 | 4100 | 1.2E-03 |
| 290 | < 1.0E-05 | 590 | 6.0E-01 | 890 | 1.2E-05 | 1190 | 3.0E-03 | 2650 | 7.3E-01 | 4150 | 9.3E-04 |
| 300 | 1.9E-05 | 600 | 5.1E-01 | 900 | 1.2E-05 | 1200 | 3.7E-03 | 2700 | 7.0E-01 | 4200 | 7.9E-04 |
| 310 | 6.7E-03 | 610 | 4.1E-01 | 910 | 1.3E-05 | 1250 | 8.7E-03 | 2750 | 5.9E-01 | 4250 | 8.8E-04 |
| 320 | 9.2E-02 | 620 | 3.2E-01 | 920 | 1.4E-05 | 1300 | 2.1E-02 | 2800 | 1.9E-01 | 4300 | 1.3E-03 |
| 330 | 2.6E-01 | 630 | 2.4E-01 | 930 | 1.5E-05 | 1350 | 4.0E-02 | 2850 | 5.6E-02 | 4350 | 2.2E-03 |
| 340 | 4.2E-01 | 640 | 1.7E-01 | 940 | 1.8E-05 | 1400 | 7.2E-02 | 2900 | 2.6E-02 | 4400 | 3.2E-03 |
| 350 | 5.3E-01 | 650 | 1.1E-01 | 950 | 2.2E-05 | 1450 | 1.1E-01 | 2950 | 1.6E-02 | 4450 | 4.3E-03 |
| 360 | 6.0E-01 | 660 | 7.2E-02 | 960 | 2.5E-05 | 1500 | 1.7E-01 | 3000 | 1.1E-02 | 4500 | 5.5E-03 |
| 370 | 6.5E-01 | 670 | 4.5E-02 | 970 | 3.0E-05 | 1550 | 2.4E-01 | 3050 | 8.4E-03 | 4550 | 6.8E-03 |
| 380 | 6.9E-01 | 680 | 2.7E-02 | 980 | 3.8E-05 | 1600 | 3.1E-01 | 3100 | 6.5E-03 | 4600 | 8.5E-03 |
| 390 | 7.3E-01 | 690 | 1.6E-02 | 990 | 4.6E-05 | 1650 | 3.8E-01 | 3150 | 5.3E-03 | 4650 | 1.0E-02 |
| 400 | 7.6E-01 | 700 | 9.0E-03 | 1000 | 5.6E-05 | 1700 | 4.6E-01 | 3200 | 4.5E-03 | 4700 | 1.2E-02 |
| 410 | 7.9E-01 | 710 | 5.1E-03 | 1010 | 7.0E-05 | 1750 | 5.2E-01 | 3250 | 4.1E-03 | 4750 | 1.4E-02 |
| 420 | 8.2E-01 | 720 | 2.8E-03 | 1020 | 8.8E-05 | 1800 | 5.8E-01 | 3300 | 4.0E-03 | 4800 | 1.6E-02 |
| 430 | 8.4E-01 | 730 | 1.6E-03 | 1030 | 1.1E-04 | 1850 | 6.4E-01 | 3350 | 4.1E-03 | 4850 | 1.8E-02 |
| 440 | 8.7E-01 | 740 | 8.8E-04 | 1040 | 1.4E-04 | 1900 | 6.8E-01 | 3400 | 4.5E-03 | 4900 | 1.9E-02 |
| 450 | 8.8E-01 | 750 | 5.0E-04 | 1050 | 1.7E-04 | 1950 | 7.2E-01 | 3450 | 5.0E-03 | 4950 | 1.9E-02 |
| 460 | 9.0E-01 | 760 | 2.9E-04 | 1060 | 2.1E-04 | 2000 | 7.5E-01 | 3500 | 6.0E-03 | 5000 | 1.6E-02 |
| 470 | 9.1E-01 | 770 | 1.8E-04 | 1070 | 2.7E-04 | 2050 | 7.8E-01 | 3550 | 7.4E-03 | 5050 | 1.2E-02 |
| 480 | 9.2E-01 | 780 | 1.1E-04 | 1080 | 3.3E-04 | 2100 | 8.0E-01 | 3600 | 9.1E-03 | 5100 | 7.9E-03 |
| 490 | 9.3E-01 | 790 | 7.2E-05 | 1090 | 4.1E-04 | 2150 | 8.1E-01 | 3650 | 1.1E-02 | 5150 | 3.8E-03 |

# Data Sheet

SCHOTT

## BG60

| Reflection factor | |
|---|---|
| $P_d$ | 0,914 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (405 nm) | ≥ | 0,78 |
| τi (514 nm) | ≥ | 0,91 |
| τi (633 nm) | ≥ | 0,10 |
| τi (694 nm) | ≤ | 0,010 |
| τi (1060 nm) | ≤ | 0,0015 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 486,1 | H | 1,54 |
| 587,6 | He | 1,53 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2,83 |

| Bubble content | |
|---|---|
| Bubble class | 2 |

| Chemical resistance | |
|---|---|
| FR class | 1 |
| SR class | 52.3 |
| AR class | 3.3 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 411 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 13,9 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_k$ [nm/°C] | - |

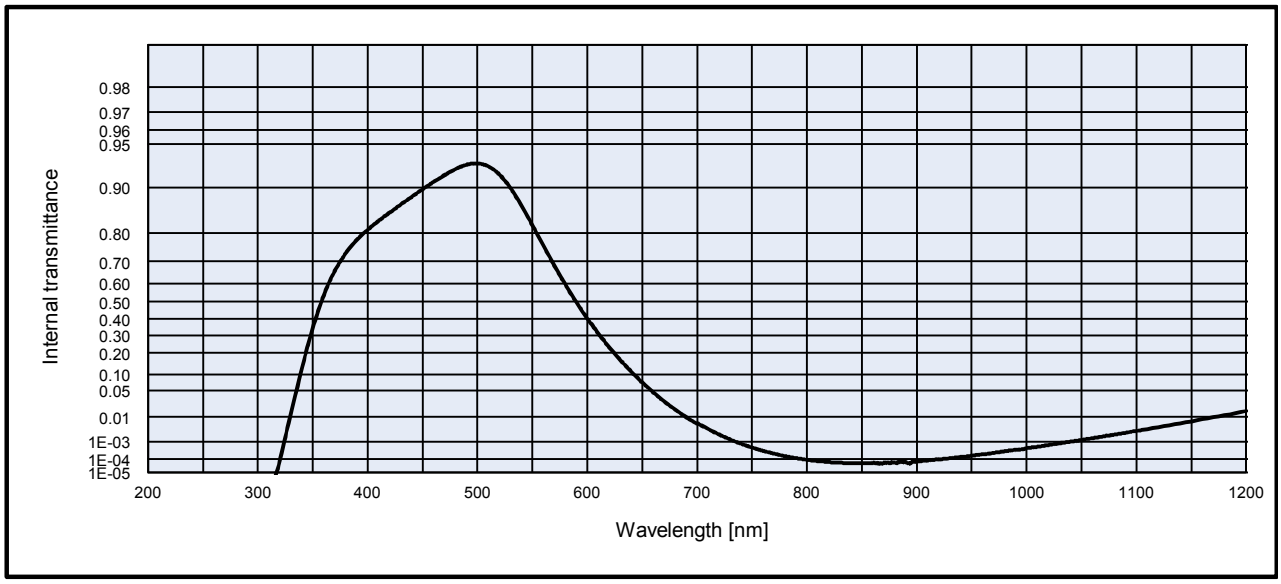
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Band pass filter / short pass filter |
| Color compensating filter / IR cut filter |
| tau_50%(thickness=0.3mm) @ 633 nm |
| |
| Knoop hardness HK (0.1/20) = 362 |
| |
| [!] |
| Long-term changes in the polished |
| surface are possible under some |
| circumstances |
| |
| no visible surface damage after 500 h |
| of humidity test 85 °C / 85 % rh |
| |
| |
| |
| **All data without tolerances are to be** |
| **understood to be reference values.** |
| **Guaranteed values are only those** |
| **values listed in the section** |
| **-Spectral values guaranteed-.** |

**Colorimetric evaluation**

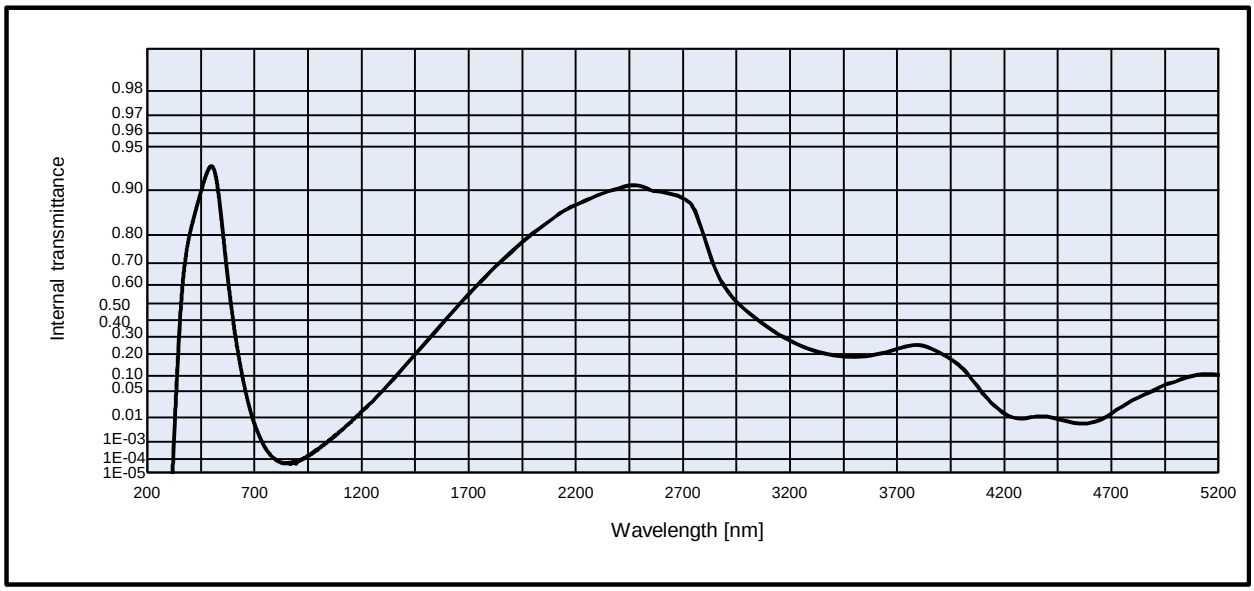
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# BG60




**Internal transmittance τi at reference thickness d = 1 mm**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1,0E-05 | 500 | 9,3E-01 | 800 | 8,7E-05 | 1100 | 3,0E-03 | 2200 | 8,7E-01 | 3700 | 2,3E-01 |
| 210 | < 1,0E-05 | 510 | 9,3E-01 | 810 | 7,2E-05 | 1110 | 3,6E-03 | 2250 | 8,8E-01 | 3750 | 2,5E-01 |
| 220 | < 1,0E-05 | 520 | 9,2E-01 | 820 | 6,1E-05 | 1120 | 4,2E-03 | 2300 | 8,9E-01 | 3800 | 2,5E-01 |
| 230 | < 1,0E-05 | 530 | 9,0E-01 | 830 | 5,5E-05 | 1130 | 5,1E-03 | 2350 | 9,0E-01 | 3850 | 2,3E-01 |
| 240 | < 1,0E-05 | 540 | 8,7E-01 | 840 | 5,2E-05 | 1140 | 6,0E-03 | 2400 | 9,0E-01 | 3900 | 2,1E-01 |
| 250 | < 1,0E-05 | 550 | 8,2E-01 | 850 | 5,0E-05 | 1150 | 7,0E-03 | 2450 | 9,1E-01 | 3950 | 1,7E-01 |
| 260 | < 1,0E-05 | 560 | 7,6E-01 | 860 | 5,2E-05 | 1160 | 8,3E-03 | 2500 | 9,1E-01 | 4000 | 1,4E-01 |
| 270 | < 1,0E-05 | 570 | 6,8E-01 | 870 | 5,7E-05 | 1170 | 9,7E-03 | 2550 | 9,0E-01 | 4050 | 8,5E-02 |
| 280 | < 1,0E-05 | 580 | 5,9E-01 | 880 | 5,7E-05 | 1180 | 1,1E-02 | 2600 | 9,0E-01 | 4100 | 4,6E-02 |
| 290 | < 1,0E-05 | 590 | 5,0E-01 | 890 | 6,3E-05 | 1190 | 1,3E-02 | 2650 | 8,9E-01 | 4150 | 2,4E-02 |
| 300 | < 1,0E-05 | 600 | 4,0E-01 | 900 | 6,9E-05 | 1200 | 1,5E-02 | 2700 | 8,9E-01 | 4200 | 1,3E-02 |
| 310 | < 1,0E-05 | 610 | 3,1E-01 | 910 | 7,7E-05 | 1250 | 2,9E-02 | 2750 | 8,7E-01 | 4250 | 9,4E-03 |
| 320 | 8,0E-05 | 620 | 2,3E-01 | 920 | 9,4E-05 | 1300 | 5,3E-02 | 2800 | 7,9E-01 | 4300 | 9,4E-03 |
| 330 | 1,3E-02 | 630 | 1,6E-01 | 930 | 1,1E-04 | 1350 | 9,0E-02 | 2850 | 6,8E-01 | 4350 | 1,1E-02 |
| 340 | 1,2E-01 | 640 | 1,1E-01 | 940 | 1,3E-04 | 1400 | 1,4E-01 | 2900 | 5,8E-01 | 4400 | 1,0E-02 |
| 350 | 3,4E-01 | 650 | 7,4E-02 | 950 | 1,6E-04 | 1450 | 2,0E-01 | 2950 | 5,1E-01 | 4450 | 8,8E-03 |
| 360 | 5,4E-01 | 660 | 4,6E-02 | 960 | 1,9E-04 | 1500 | 2,7E-01 | 3000 | 4,5E-01 | 4500 | 7,1E-03 |
| 370 | 6,6E-01 | 670 | 2,8E-02 | 970 | 2,4E-04 | 1550 | 3,4E-01 | 3050 | 4,0E-01 | 4550 | 6,2E-03 |
| 380 | 7,3E-01 | 680 | 1,7E-02 | 980 | 3,0E-04 | 1600 | 4,2E-01 | 3100 | 3,5E-01 | 4600 | 6,3E-03 |
| 390 | 7,8E-01 | 690 | 9,8E-03 | 990 | 3,7E-04 | 1650 | 4,9E-01 | 3150 | 3,1E-01 | 4650 | 8,3E-03 |
| 400 | 8,1E-01 | 700 | 5,7E-03 | 1000 | 4,4E-04 | 1700 | 5,5E-01 | 3200 | 2,8E-01 | 4700 | 1,3E-02 |
| 410 | 8,3E-01 | 710 | 3,6E-03 | 1010 | 5,4E-04 | 1750 | 6,1E-01 | 3250 | 2,5E-01 | 4750 | 2,1E-02 |
| 420 | 8,5E-01 | 720 | 2,1E-03 | 1020 | 6,6E-04 | 1800 | 6,6E-01 | 3300 | 2,2E-01 | 4800 | 3,1E-02 |
| 430 | 8,7E-01 | 730 | 1,3E-03 | 1030 | 7,9E-04 | 1850 | 7,1E-01 | 3350 | 2,1E-01 | 4850 | 4,2E-02 |
| 440 | 8,8E-01 | 740 | 7,6E-04 | 1040 | 9,9E-04 | 1900 | 7,5E-01 | 3400 | 1,9E-01 | 4900 | 5,3E-02 |
| 450 | 9,0E-01 | 750 | 4,8E-04 | 1050 | 1,2E-03 | 1950 | 7,8E-01 | 3450 | 1,9E-01 | 4950 | 6,8E-02 |
| 460 | 9,1E-01 | 760 | 3,1E-04 | 1060 | 1,4E-03 | 2000 | 8,1E-01 | 3500 | 1,9E-01 | 5000 | 7,9E-02 |
| 470 | 9,2E-01 | 770 | 2,1E-04 | 1070 | 1,7E-03 | 2050 | 8,3E-01 | 3550 | 1,9E-01 | 5050 | 9,3E-02 |
| 480 | 9,3E-01 | 780 | 1,5E-04 | 1080 | 2,1E-03 | 2100 | 8,5E-01 | 3600 | 2,0E-01 | 5100 | 1,0E-01 |
| 490 | 9,3E-01 | 790 | 1,1E-04 | 1090 | 2,5E-03 | 2150 | 8,6E-01 | 3650 | 2,1E-01 | 5150 | 1,1E-01 |

# Data Sheet

SCHOTT

## BG61

| Reflection factor | |
|---|---|
| $P_d$ | 0,914 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (405 nm) | ≥ | 0,84 |
| τi (514 nm) | ≥ | 0,93 |
| τi (633 nm) | ≥ | 0,18 |
| τi (694 nm) | ≤ | 0,030 |
| τi (1060 nm) | ≤ | 0,008 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 486,1 | H | 1,53 |
| 587,6 | He | 1,53 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2,81 |

| Bubble content | |
|---|---|
| Bubble class | 2 |

| Chemical resistance | |
|---|---|
| FR class | 1 |
| SR class | 52.3 |
| AR class | 3.3 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 402 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 11,9 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 13,9 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_k$ [nm/°C] | - |

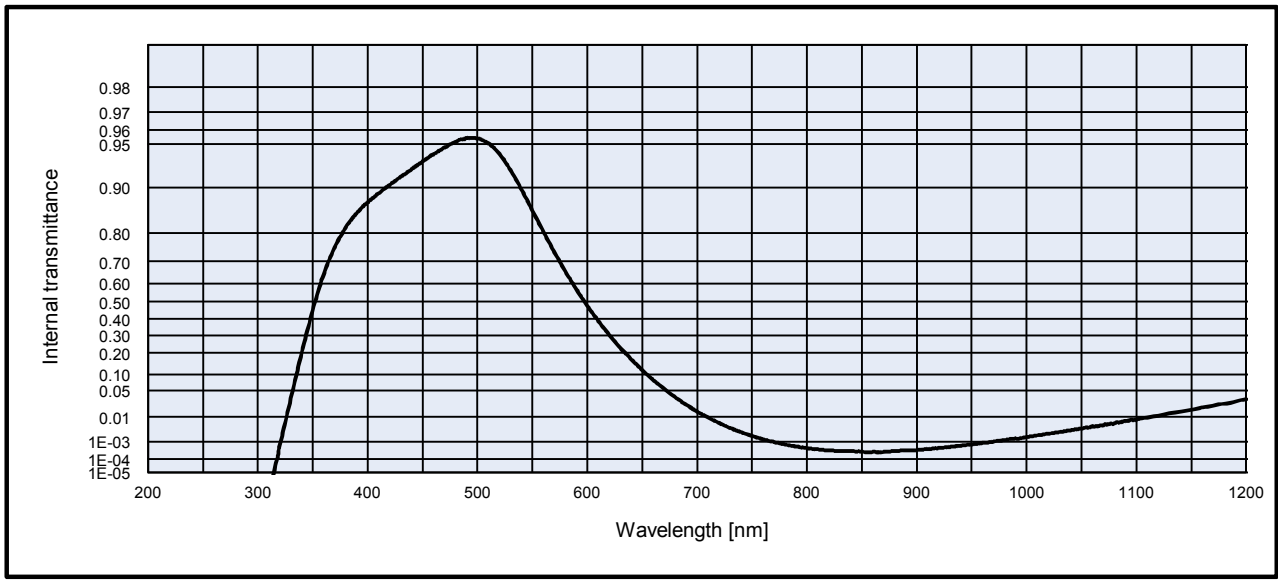
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Band pass filter / short pass filter |
| Color compensating filter / IR cut filter |
| tau_50%(thickness=0.3mm) @ 644 nm |
| |
| Knoop hardness HK (0.1/20) = 365 |
| |
| [!] |
| Long-term changes in the polished |
| surface are possible under some |
| circumstances |
| |
| no visible surface damage after 500 h |
| of humidity test 85 °C / 85 % rh |
| |
| |
| |
| **All data without tolerances are to be** |
| **understood to be reference values.** |
| **Guaranteed values are only those** |
| **values listed in the section** |
| **-Spectral values guaranteed-.** |

**Colorimetric evaluation**

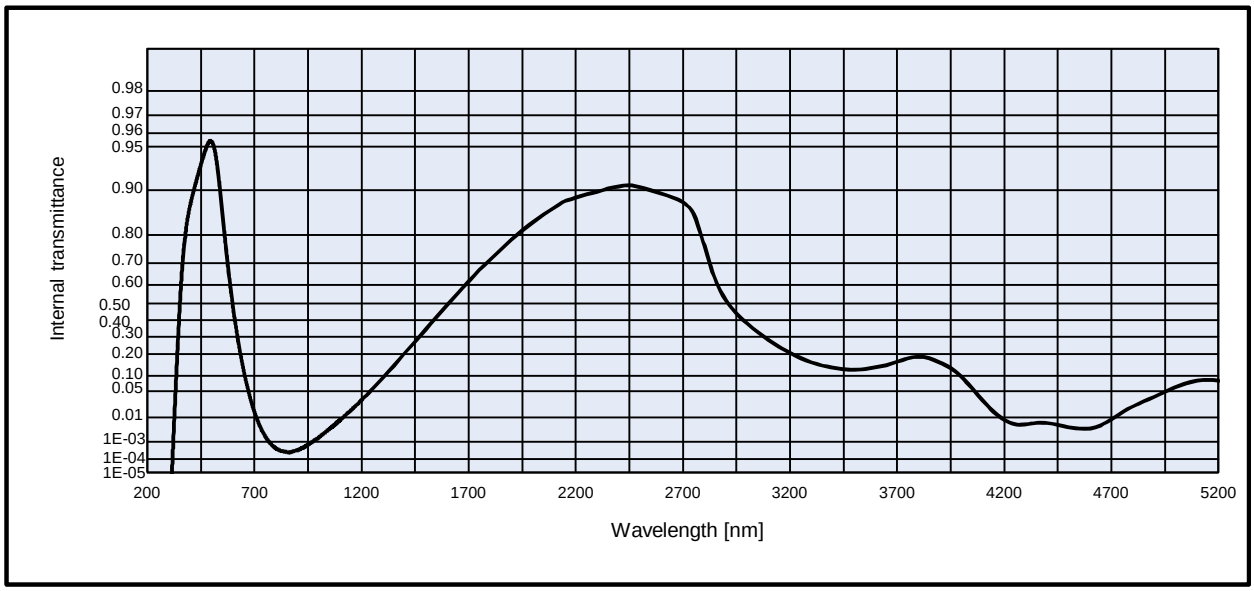
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# BG61




**Internal transmittance τi at reference thickness d = 1 mm**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1,0E-05 | 500 | 9,5E-01 | 800 | 4,4E-04 | 1100 | 8,1E-03 | 2200 | 8,9E-01 | 3700 | 1,6E-01 |
| 210 | < 1,0E-05 | 510 | 9,5E-01 | 810 | 3,8E-04 | 1110 | 9,4E-03 | 2250 | 8,9E-01 | 3750 | 1,8E-01 |
| 220 | < 1,0E-05 | 520 | 9,4E-01 | 820 | 3,3E-04 | 1120 | 1,1E-02 | 2300 | 9,0E-01 | 3800 | 1,9E-01 |
| 230 | < 1,0E-05 | 530 | 9,2E-01 | 830 | 3,1E-04 | 1130 | 1,3E-02 | 2350 | 9,0E-01 | 3850 | 1,8E-01 |
| 240 | < 1,0E-05 | 540 | 9,0E-01 | 840 | 2,9E-04 | 1140 | 1,5E-02 | 2400 | 9,1E-01 | 3900 | 1,6E-01 |
| 250 | < 1,0E-05 | 550 | 8,6E-01 | 850 | 2,8E-04 | 1150 | 1,7E-02 | 2450 | 9,1E-01 | 3950 | 1,3E-01 |
| 260 | < 1,0E-05 | 560 | 8,0E-01 | 860 | 2,7E-04 | 1160 | 2,0E-02 | 2500 | 9,0E-01 | 4000 | 9,7E-02 |
| 270 | < 1,0E-05 | 570 | 7,4E-01 | 870 | 2,7E-04 | 1170 | 2,2E-02 | 2550 | 9,0E-01 | 4050 | 5,8E-02 |
| 280 | < 1,0E-05 | 580 | 6,6E-01 | 880 | 3,1E-04 | 1180 | 2,5E-02 | 2600 | 8,9E-01 | 4100 | 3,0E-02 |
| 290 | < 1,0E-05 | 590 | 5,7E-01 | 890 | 3,3E-04 | 1190 | 2,8E-02 | 2650 | 8,9E-01 | 4150 | 1,5E-02 |
| 300 | < 1,0E-05 | 600 | 4,8E-01 | 900 | 3,4E-04 | 1200 | 3,2E-02 | 2700 | 8,8E-01 | 4200 | 8,2E-03 |
| 310 | < 1,0E-05 | 610 | 3,9E-01 | 910 | 3,9E-04 | 1250 | 5,6E-02 | 2750 | 8,6E-01 | 4250 | 5,7E-03 |
| 320 | 6,5E-04 | 620 | 3,0E-01 | 920 | 4,6E-04 | 1300 | 9,3E-02 | 2800 | 7,7E-01 | 4300 | 5,7E-03 |
| 330 | 3,3E-02 | 630 | 2,3E-01 | 930 | 5,1E-04 | 1350 | 1,4E-01 | 2850 | 6,3E-01 | 4350 | 6,4E-03 |
| 340 | 2,0E-01 | 640 | 1,7E-01 | 940 | 5,8E-04 | 1400 | 2,0E-01 | 2900 | 5,2E-01 | 4400 | 6,3E-03 |
| 350 | 4,5E-01 | 650 | 1,2E-01 | 950 | 6,9E-04 | 1450 | 2,7E-01 | 2950 | 4,4E-01 | 4450 | 5,4E-03 |
| 360 | 6,4E-01 | 660 | 8,1E-02 | 960 | 8,5E-04 | 1500 | 3,4E-01 | 3000 | 3,8E-01 | 4500 | 4,4E-03 |
| 370 | 7,5E-01 | 670 | 5,5E-02 | 970 | 9,9E-04 | 1550 | 4,2E-01 | 3050 | 3,3E-01 | 4550 | 3,8E-03 |
| 380 | 8,2E-01 | 680 | 3,6E-02 | 980 | 1,2E-03 | 1600 | 4,9E-01 | 3100 | 2,8E-01 | 4600 | 3,9E-03 |
| 390 | 8,5E-01 | 690 | 2,3E-02 | 990 | 1,4E-03 | 1650 | 5,6E-01 | 3150 | 2,4E-01 | 4650 | 5,2E-03 |
| 400 | 8,7E-01 | 700 | 1,5E-02 | 1000 | 1,6E-03 | 1700 | 6,2E-01 | 3200 | 2,1E-01 | 4700 | 8,6E-03 |
| 410 | 8,9E-01 | 710 | 9,5E-03 | 1010 | 1,9E-03 | 1750 | 6,7E-01 | 3250 | 1,8E-01 | 4750 | 1,4E-02 |
| 420 | 9,0E-01 | 720 | 6,1E-03 | 1020 | 2,3E-03 | 1800 | 7,2E-01 | 3300 | 1,6E-01 | 4800 | 2,1E-02 |
| 430 | 9,2E-01 | 730 | 4,0E-03 | 1030 | 2,7E-03 | 1850 | 7,5E-01 | 3350 | 1,4E-01 | 4850 | 2,9E-02 |
| 440 | 9,3E-01 | 740 | 2,7E-03 | 1040 | 3,2E-03 | 1900 | 7,9E-01 | 3400 | 1,3E-01 | 4900 | 3,8E-02 |
| 450 | 9,3E-01 | 750 | 1,8E-03 | 1050 | 3,8E-03 | 1950 | 8,1E-01 | 3450 | 1,3E-01 | 4950 | 4,9E-02 |
| 460 | 9,4E-01 | 760 | 1,3E-03 | 1060 | 4,6E-03 | 2000 | 8,4E-01 | 3500 | 1,2E-01 | 5000 | 6,2E-02 |
| 470 | 9,5E-01 | 770 | 9,4E-04 | 1070 | 5,0E-03 | 2050 | 8,5E-01 | 3550 | 1,3E-01 | 5050 | 7,4E-02 |
| 480 | 9,5E-01 | 780 | 7,1E-04 | 1080 | 6,0E-03 | 2100 | 8,7E-01 | 3600 | 1,3E-01 | 5100 | 8,2E-02 |
| 490 | 9,5E-01 | 790 | 5,5E-04 | 1090 | 7,3E-03 | 2150 | 8,8E-01 | 3650 | 1,5E-01 | 5150 | 8,5E-02 |

# Data Sheet

SCHOTT

## S-8022

| Reflection factor | |
|---|---|
| $P_d$ | 0,91 |

| Reference thickness | |
|---|---|
| d [mm] | 2 |

| Values guaranteed | | |
|---|---|---|
| The color of the glass is within a circle of the | | |
| CIE Yu' v' UCS (1976), defined by | | |
| $(u' - 0{,}088)^2 + (v' - 0{,}543)^2 = (0{,}037)^2$ | | |
| for any black body radiator 1500 K to 3200 K | | |
| Black body radiator | Photopic Transmittance [%] | |
| 2100 K | 13.5 | ± 1.5 |
| 1500 K | 9.0 | ± 1.5 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587,6 | He | 1,555 |
| | | ± 0,005 |
| | | |
| | | |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2,77 |

| Bubble content | |
|---|---|
| Bubble class | 1 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 4.0 |
| AR class | 3.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 453 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7,8 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 8,9 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |
| | |
| | |
| | |
| | |

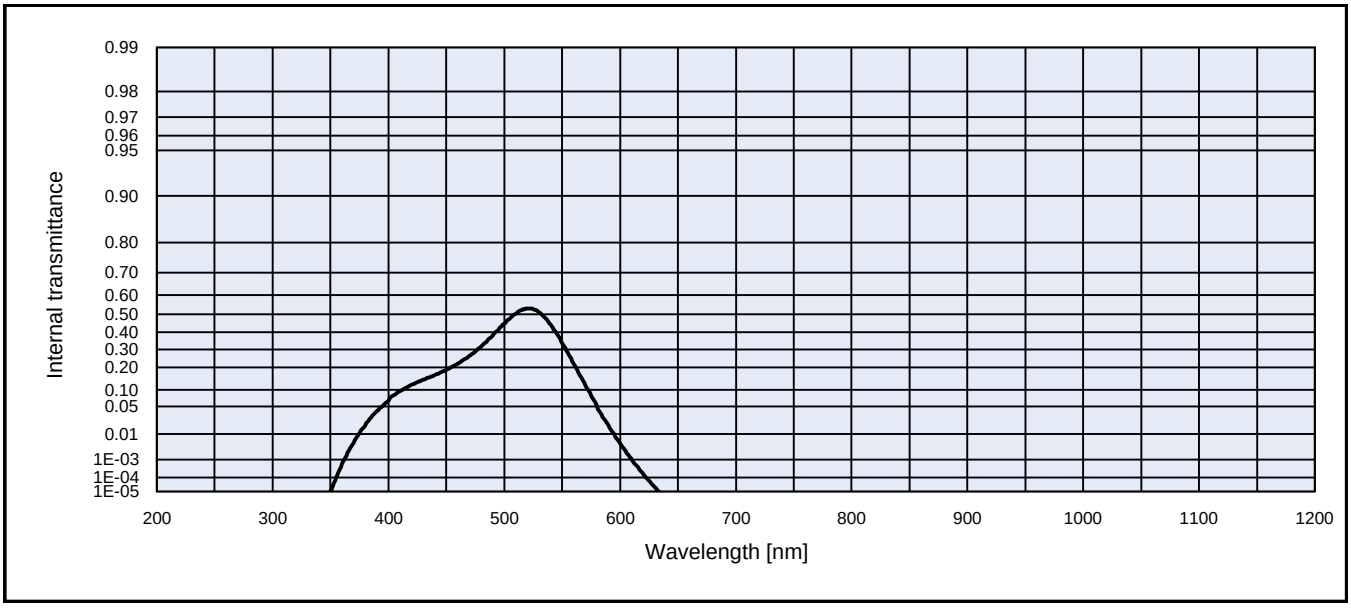
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Band pass filter / short pass filter |
| NVIS-Greeen A - 2 mm Band Pass Filter |
| according to MIL-STD-3009 |
| |
| passed thermal shock test as per |
| MIL-STD-202F method 107F, Condition A |
| |
| [!!] |
| protective coatings recommended |
| Long-term changes in the polished |
| surface are possible |
| |
| |
| |
| |
| |
| **All data without tolerances are to be understood to be reference values.** |
| **Guaranteed values are only those values listed in the section -Spectral values guaranteed-.** |

**Colorimetric evaluation**

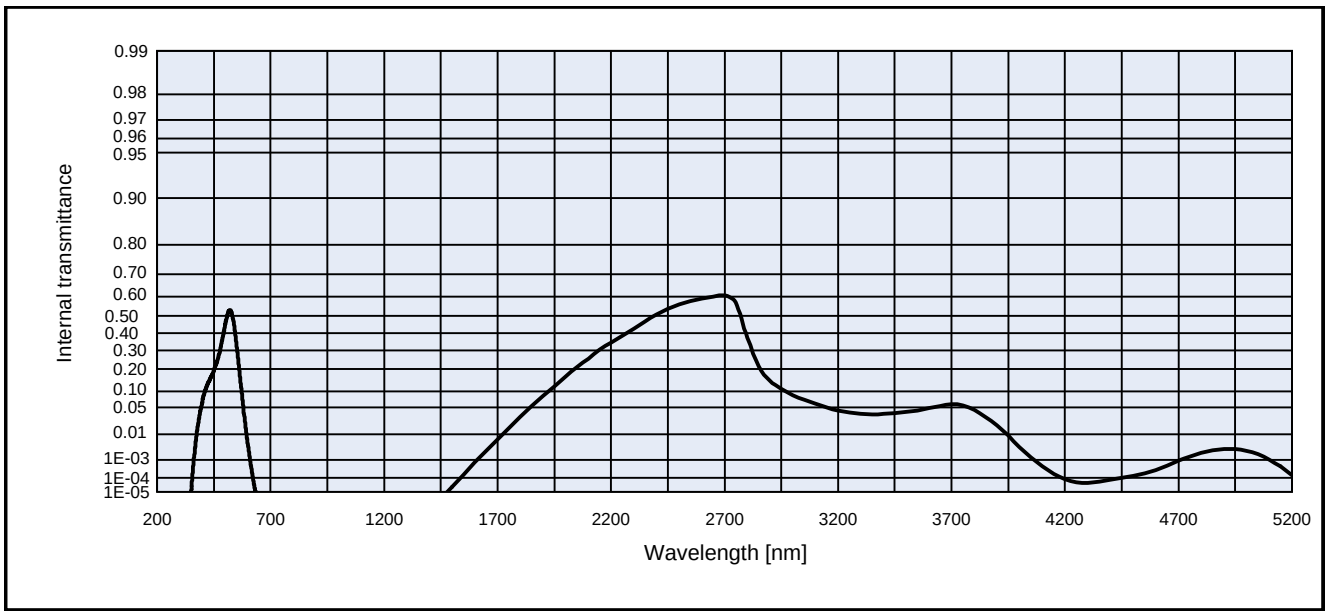
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0,253 | 0,203 | 0,178 |
| y | 0,498 | 0,549 | 0,593 |
| Y | 30 | 16 | 9 |
| $\lambda_d$ [nm] | 503 | 505 | 508 |
| $P_e$ | 0,44 | 0,55 | 0,61 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0,241 | 0,196 | 0,173 |
| y | 0,478 | 0,530 | 0,577 |
| Y | 31 | 16 | 10 |
| $\lambda_d$ [nm] | 502 | 504 | 507 |
| $P_e$ | 0,44 | 0,54 | 0,60 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0,196 | 0,169 | 0,154 |
| y | 0,374 | 0,432 | 0,492 |
| Y | 37 | 21 | 12 |
| $\lambda_d$ [nm] | 496 | 500 | 505 |
| $P_e$ | 0,40 | 0,47 | 0,51 |



# S-8022




**Internal transmittance τi at reference thickness d = 2 mm**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $T_i$ | λ [nm] | $T_i$ | λ [nm] | $T_i$ | λ [nm] | $T_i$ | λ [nm] | $T_i$ | λ [nm] | $T_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1,0E-05 | 500 | 4,5E-01 | 800 | < 1,0E-05 | 1100 | < 1,0E-05 | 2200 | 3,5E-01 | 3700 | 5,8E-02 |
| 210 | < 1,0E-05 | 510 | 5,0E-01 | 810 | < 1,0E-05 | 1110 | < 1,0E-05 | 2250 | 3,9E-01 | 3750 | 5,5E-02 |
| 220 | < 1,0E-05 | 520 | 5,3E-01 | 820 | < 1,0E-05 | 1120 | < 1,0E-05 | 2300 | 4,3E-01 | 3800 | 4,4E-02 |
| 230 | < 1,0E-05 | 530 | 5,1E-01 | 830 | < 1,0E-05 | 1130 | < 1,0E-05 | 2350 | 4,7E-01 | 3850 | 3,1E-02 |
| 240 | < 1,0E-05 | 540 | 4,4E-01 | 840 | < 1,0E-05 | 1140 | < 1,0E-05 | 2400 | 5,1E-01 | 3900 | 1,9E-02 |
| 250 | < 1,0E-05 | 550 | 3,4E-01 | 850 | < 1,0E-05 | 1150 | < 1,0E-05 | 2450 | 5,4E-01 | 3950 | 9,3E-03 |
| 260 | < 1,0E-05 | 560 | 2,2E-01 | 860 | < 1,0E-05 | 1160 | < 1,0E-05 | 2500 | 5,6E-01 | 4000 | 3,7E-03 |
| 270 | < 1,0E-05 | 570 | 1,2E-01 | 870 | < 1,0E-05 | 1170 | < 1,0E-05 | 2550 | 5,8E-01 | 4050 | 1,3E-03 |
| 280 | < 1,0E-05 | 580 | 5,3E-02 | 880 | < 1,0E-05 | 1180 | < 1,0E-05 | 2600 | 5,9E-01 | 4100 | 4,6E-04 |
| 290 | < 1,0E-05 | 590 | 1,7E-02 | 890 | < 1,0E-05 | 1190 | < 1,0E-05 | 2650 | 6,0E-01 | 4150 | 1,8E-04 |
| 300 | < 1,0E-05 | 600 | 4,7E-03 | 900 | < 1,0E-05 | 1200 | < 1,0E-05 | 2700 | 6,1E-01 | 4200 | 8,4E-05 |
| 310 | < 1,0E-05 | 610 | 9,9E-04 | 910 | < 1,0E-05 | 1250 | < 1,0E-05 | 2750 | 5,7E-01 | 4250 | 5,4E-05 |
| 320 | < 1,0E-05 | 620 | 1,6E-04 | 920 | < 1,0E-05 | 1300 | < 1,0E-05 | 2800 | 3,7E-01 | 4300 | 4,8E-05 |
| 330 | < 1,0E-05 | 630 | 2,1E-05 | 930 | < 1,0E-05 | 1350 | < 1,0E-05 | 2850 | 2,1E-01 | 4350 | 5,8E-05 |
| 340 | < 1,0E-05 | 640 | < 1,0E-05 | 940 | < 1,0E-05 | 1400 | < 1,0E-05 | 2900 | 1,4E-01 | 4400 | 7,8E-05 |
| 350 | < 1,0E-05 | 650 | < 1,0E-05 | 950 | < 1,0E-05 | 1450 | < 1,0E-05 | 2950 | 1,1E-01 | 4450 | 1,0E-04 |
| 360 | 5,7E-04 | 660 | < 1,0E-05 | 960 | < 1,0E-05 | 1500 | 2,4E-05 | 3000 | 8,6E-02 | 4500 | 1,4E-04 |
| 370 | 5,2E-03 | 670 | < 1,0E-05 | 970 | < 1,0E-05 | 1550 | 1,6E-04 | 3050 | 7,1E-02 | 4550 | 2,0E-04 |
| 380 | 1,8E-02 | 680 | < 1,0E-05 | 980 | < 1,0E-05 | 1600 | 7,4E-04 | 3100 | 5,9E-02 | 4600 | 3,0E-04 |
| 390 | 4,0E-02 | 690 | < 1,0E-05 | 990 | < 1,0E-05 | 1650 | 2,5E-03 | 3150 | 5,0E-02 | 4650 | 5,2E-04 |
| 400 | 6,5E-02 | 700 | < 1,0E-05 | 1000 | < 1,0E-05 | 1700 | 6,9E-03 | 3200 | 4,4E-02 | 4700 | 9,0E-04 |
| 410 | 9,6E-02 | 710 | < 1,0E-05 | 1010 | < 1,0E-05 | 1750 | 1,6E-02 | 3250 | 3,9E-02 | 4750 | 1,4E-03 |
| 420 | 1,2E-01 | 720 | < 1,0E-05 | 1020 | < 1,0E-05 | 1800 | 3,1E-02 | 3300 | 3,7E-02 | 4800 | 2,0E-03 |
| 430 | 1,4E-01 | 730 | < 1,0E-05 | 1030 | < 1,0E-05 | 1850 | 5,3E-02 | 3350 | 3,6E-02 | 4850 | 2,6E-03 |
| 440 | 1,6E-01 | 740 | < 1,0E-05 | 1040 | < 1,0E-05 | 1900 | 8,3E-02 | 3400 | 3,6E-02 | 4900 | 3,0E-03 |
| 450 | 1,9E-01 | 750 | < 1,0E-05 | 1050 | < 1,0E-05 | 1950 | 1,2E-01 | 3450 | 3,7E-02 | 4950 | 3,0E-03 |
| 460 | 2,2E-01 | 760 | < 1,0E-05 | 1060 | < 1,0E-05 | 2000 | 1,6E-01 | 3500 | 4,0E-02 | 5000 | 2,5E-03 |
| 470 | 2,6E-01 | 770 | < 1,0E-05 | 1070 | < 1,0E-05 | 2050 | 2,1E-01 | 3550 | 4,4E-02 | 5050 | 1,8E-03 |
| 480 | 3,2E-01 | 780 | < 1,0E-05 | 1080 | < 1,0E-05 | 2100 | 2,5E-01 | 3600 | 4,9E-02 | 5100 | 1,0E-03 |
| 490 | 3,8E-01 | 790 | < 1,0E-05 | 1090 | < 1,0E-05 | 2150 | 3,0E-01 | 3650 | 5,4E-02 | 5150 | 4,6E-04 |

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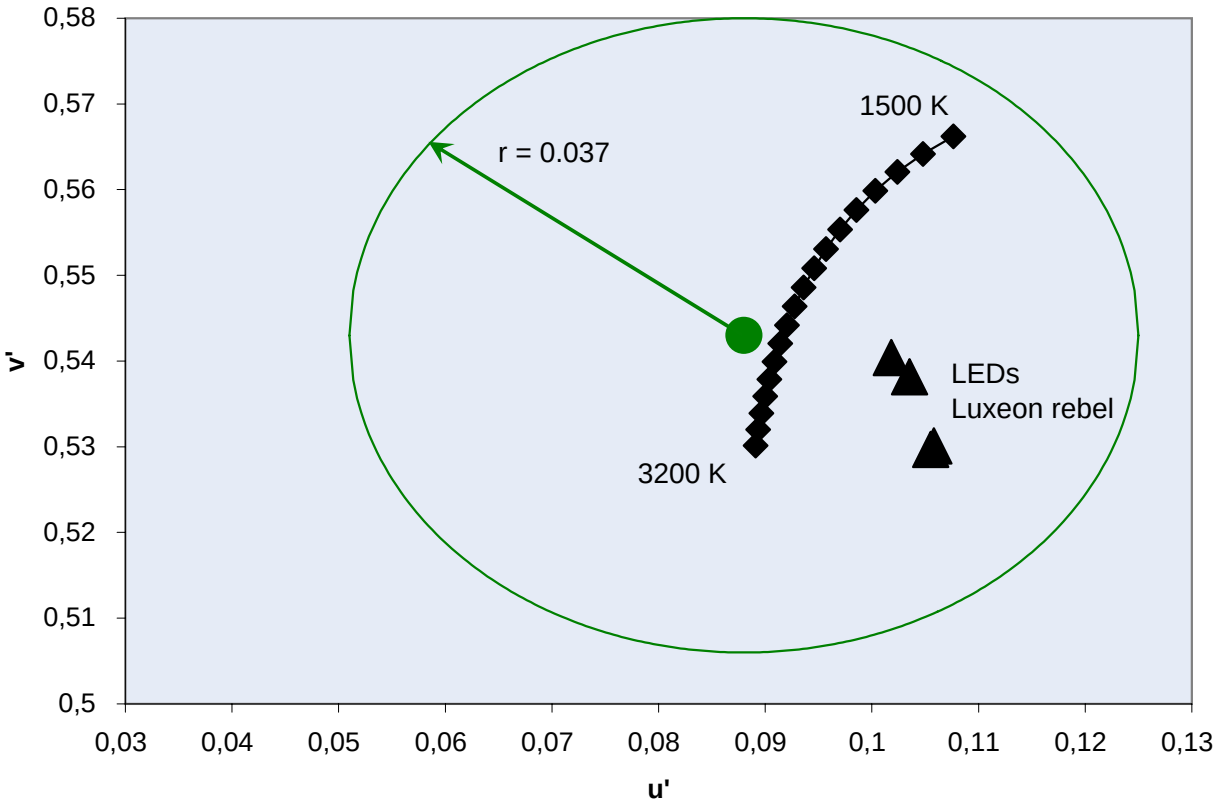
**Chromaticity dependence on Incandescent Color Temperature**




**Chromaticity and NVIS Radiance at thickness d = 2 mm**

| Planck [K] | u' | v' | x | y | Y | $NR_A$ |
|---|---|---|---|---|---|---|
| 1500 | 0,108 | 0,566 | 0,270 | 0,631 | 9,5 | 6,1E-11 |
| 1600 | 0,105 | 0,564 | 0,262 | 0,627 | 10,4 | 5,8E-11 |
| 1700 | 0,102 | 0,562 | 0,254 | 0,621 | 11,2 | 5,6E-11 |
| 1800 | 0,100 | 0,560 | 0,248 | 0,615 | 11,9 | 5,4E-11 |
| 1900 | 0,099 | 0,558 | 0,242 | 0,608 | 12,6 | 5,2E-11 |
| 2000 | 0,097 | 0,555 | 0,236 | 0,601 | 13,3 | 5,1E-11 |
| 2100 | 0,096 | 0,553 | 0,231 | 0,594 | 13,9 | 5,0E-11 |
| 2200 | 0,095 | 0,551 | 0,227 | 0,587 | 14,5 | 4,9E-11 |
| 2300 | 0,094 | 0,549 | 0,223 | 0,580 | 15,0 | 4,8E-11 |
| 2400 | 0,093 | 0,546 | 0,219 | 0,573 | 15,5 | 4,7E-11 |
| 2500 | 0,092 | 0,544 | 0,215 | 0,566 | 15,9 | 4,7E-11 |
| 2600 | 0,091 | 0,542 | 0,212 | 0,559 | 16,3 | 4,6E-11 |
| 2700 | 0,091 | 0,540 | 0,209 | 0,553 | 16,7 | 4,6E-11 |
| 2800 | 0,090 | 0,538 | 0,207 | 0,547 | 17,1 | 4,5E-11 |
| 2900 | 0,090 | 0,536 | 0,204 | 0,540 | 17,4 | 4,5E-11 |
| 3000 | 0,090 | 0,534 | 0,202 | 0,535 | 17,8 | 4,4E-11 |
| 3100 | 0,089 | 0,532 | 0,200 | 0,529 | 18,1 | 4,4E-11 |
| 3200 | 0,089 | 0,530 | 0,198 | 0,523 | 18,4 | 4,4E-11 |

| LED | u' | v' | x | y | Y | $NR_A$ |
|---|---|---|---|---|---|---|
| LUXEON rebel A2-RM-G | 0,102 | 0,540 | 0,231 | 0,545 | 21,1 | 4,2E-11 |
| LUXEON rebel T2-SO-L | 0,106 | 0,530 | 0,229 | 0,511 | 20,9 | 4,2E-11 |
| LUXEON rebel B5-R0-G | 0,106 | 0,530 | 0,228 | 0,510 | 20,7 | 4,3E-11 |
| LUXEON rebel Q1-RM-K | 0,104 | 0,538 | 0,232 | 0,537 | 20,7 | 4,3E-11 |
| **other sources of illumination** | A service for calculating chromaticity or NVIS radiance can be provided | | | | | |

**NVIS Green A**

**Chromaticity coodinates (as defined by MIL-STD-3009)**

**u' = 0.088**
**v' = 0.543**

**with radius of tolerance r = 0.037**

# Data Sheet

SCHOTT

## S-8023

| Density | |
|---|---|
| ρ [g/cm³] | 2,75 |

| Reflection factor | |
|---|---|
| $P_d$ | 0,913 |

| Bubble content | |
|---|---|
| Bubble class | 1 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 4.0 |
| AR class | 3.0 |

| Values guaranteed | | |
|---|---|---|
| The color of the glass is within a circle of the | | |
| CIE Yu' v' UCS (1976), defined by | | |
| $(u' - 0{,}088)^2 + (v' - 0{,}543)^2 = (0{,}037)^2$ | | |
| for any black body radiator 1500 K to 3200 K | | |
| Black body radiator | Photopic Transmittance [%] | |
| 2100 K | 15.0 | ± 1.5 |
| 1500 K | 10.0 | ± 1.5 |

| Transformation temperature | |
|---|---|
| Tg [°C] | (444) |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | 9,7 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587,6 | He | 1,541 |
| | | ± 0,005 |
| | | |
| | | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |
| | |
| | |
| | |
| | |

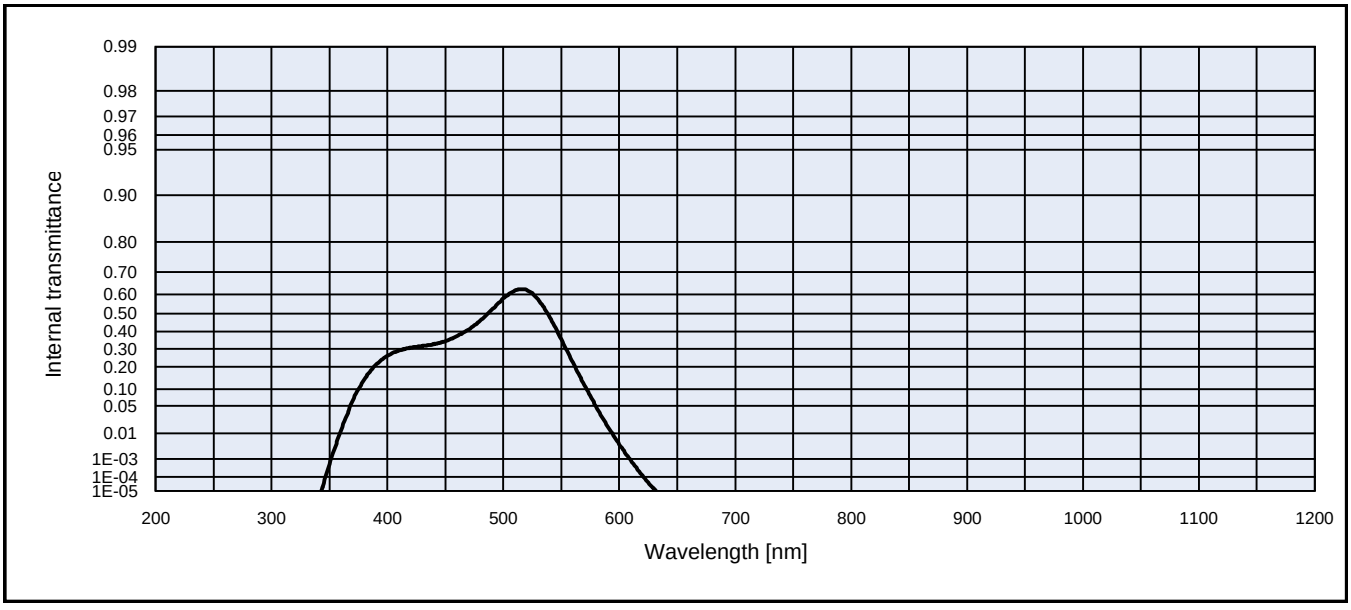
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Band pass filter / short pass filter |
| NVIS-Greeen A - 2 mm Band Pass Filter |
| according to MIL-STD-3009 |
| |
| passed thermal shock test as per |
| MIL-STD-202F method 107F, Condition A |
| |
| [!!] |
| protective coatings recommended |
| Long-term changes in the polished |
| surface are possible |
| |
| |
| |
| |
| |
| **All data without tolerances are to be understood to be reference values.** |
| **Guaranteed values are only those values listed in the section -Spectral values guaranteed-.** |

**Colorimetric evaluation**

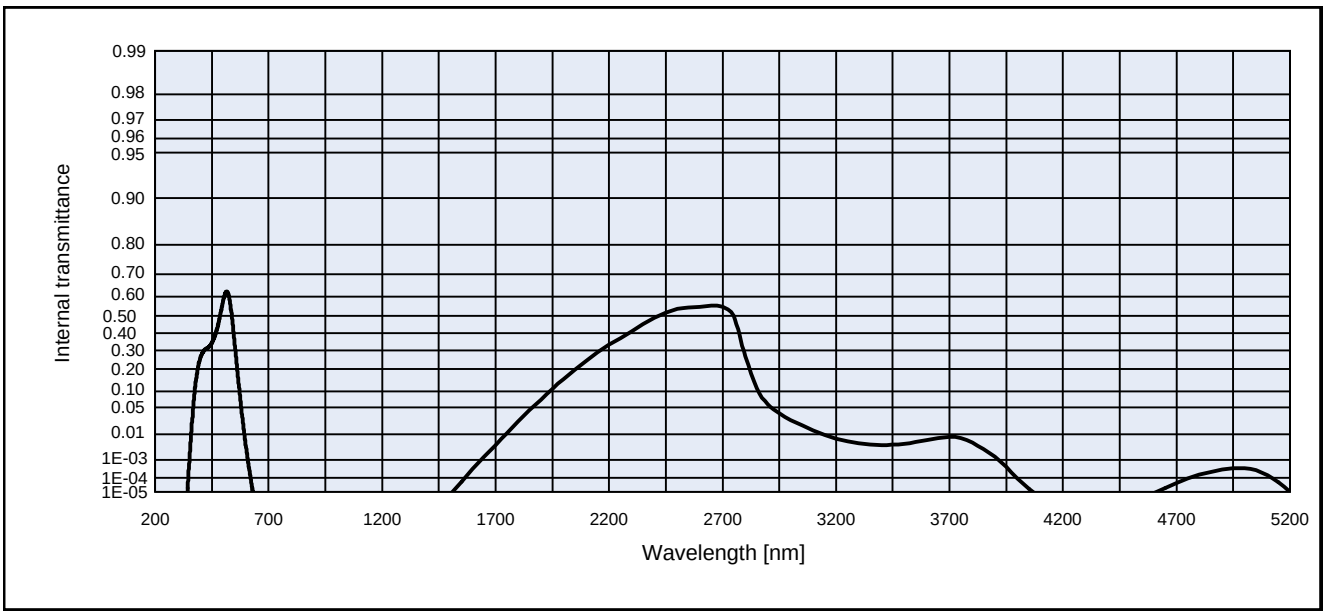
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0,277 | 0,218 | 0,189 |
| y | 0,459 | 0,474 | 0,486 |
| Y | 41 | 27 | 19 |
| $\lambda_d$ [nm] | 500 | 500 | 500 |
| $P_e$ | 0,39 | 0,52 | 0,59 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0,262 | 0,209 | 0,182 |
| y | 0,437 | 0,449 | 0,460 |
| Y | 43 | 28 | 21 |
| $\lambda_d$ [nm] | 498 | 498 | 499 |
| $P_e$ | 0,39 | 0,52 | 0,59 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0,206 | 0,176 | 0,160 |
| y | 0,328 | 0,334 | 0,346 |
| Y | 51 | 35 | 26 |
| $\lambda_d$ [nm] | 491 | 492 | 493 |
| $P_e$ | 0,39 | 0,50 | 0,54 |



# S-8023




**Internal transmittance τi at reference thickness d = 3 mm**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1,0E-05 | 500 | 5,8E-01 | 800 | < 1,0E-05 | 1100 | < 1,0E-05 | 2200 | 3,3E-01 | 3700 | 8,5E-03 |
| 210 | < 1,0E-05 | 510 | 6,2E-01 | 810 | < 1,0E-05 | 1110 | < 1,0E-05 | 2250 | 3,7E-01 | 3750 | 7,8E-03 |
| 220 | < 1,0E-05 | 520 | 6,2E-01 | 820 | < 1,0E-05 | 1120 | < 1,0E-05 | 2300 | 4,1E-01 | 3800 | 5,4E-03 |
| 230 | < 1,0E-05 | 530 | 5,8E-01 | 830 | < 1,0E-05 | 1130 | < 1,0E-05 | 2350 | 4,5E-01 | 3850 | 3,0E-03 |
| 240 | < 1,0E-05 | 540 | 4,8E-01 | 840 | < 1,0E-05 | 1140 | < 1,0E-05 | 2400 | 4,9E-01 | 3900 | 1,4E-03 |
| 250 | < 1,0E-05 | 550 | 3,5E-01 | 850 | < 1,0E-05 | 1150 | < 1,0E-05 | 2450 | 5,2E-01 | 3950 | 4,3E-04 |
| 260 | < 1,0E-05 | 560 | 2,2E-01 | 860 | < 1,0E-05 | 1160 | < 1,0E-05 | 2500 | 5,4E-01 | 4000 | 9,2E-05 |
| 270 | < 1,0E-05 | 570 | 1,2E-01 | 870 | < 1,0E-05 | 1170 | < 1,0E-05 | 2550 | 5,5E-01 | 4050 | 1,8E-05 |
| 280 | < 1,0E-05 | 580 | 4,9E-02 | 880 | < 1,0E-05 | 1180 | < 1,0E-05 | 2600 | 5,5E-01 | 4100 | < 1,0E-05 |
| 290 | < 1,0E-05 | 590 | 1,6E-02 | 890 | < 1,0E-05 | 1190 | < 1,0E-05 | 2650 | 5,5E-01 | 4150 | < 1,0E-05 |
| 300 | < 1,0E-05 | 600 | 4,1E-03 | 900 | < 1,0E-05 | 1200 | < 1,0E-05 | 2700 | 5,5E-01 | 4200 | < 1,0E-05 |
| 310 | < 1,0E-05 | 610 | 8,1E-04 | 910 | < 1,0E-05 | 1250 | < 1,0E-05 | 2750 | 5,0E-01 | 4250 | < 1,0E-05 |
| 320 | < 1,0E-05 | 620 | 1,2E-04 | 920 | < 1,0E-05 | 1300 | < 1,0E-05 | 2800 | 2,7E-01 | 4300 | < 1,0E-05 |
| 330 | < 1,0E-05 | 630 | 1,4E-05 | 930 | < 1,0E-05 | 1350 | < 1,0E-05 | 2850 | 1,1E-01 | 4350 | < 1,0E-05 |
| 340 | < 1,0E-05 | 640 | < 1,0E-05 | 940 | < 1,0E-05 | 1400 | < 1,0E-05 | 2900 | 5,9E-02 | 4400 | < 1,0E-05 |
| 350 | 5,3E-04 | 650 | < 1,0E-05 | 950 | < 1,0E-05 | 1450 | < 1,0E-05 | 2950 | 3,7E-02 | 4450 | < 1,0E-05 |
| 360 | 1,2E-02 | 660 | < 1,0E-05 | 960 | < 1,0E-05 | 1500 | < 1,0E-05 | 3000 | 2,6E-02 | 4500 | < 1,0E-05 |
| 370 | 6,4E-02 | 670 | < 1,0E-05 | 970 | < 1,0E-05 | 1550 | 5,8E-05 | 3050 | 1,8E-02 | 4550 | < 1,0E-05 |
| 380 | 1,4E-01 | 680 | < 1,0E-05 | 980 | < 1,0E-05 | 1600 | 3,3E-04 | 3100 | 1,3E-02 | 4600 | < 1,0E-05 |
| 390 | 2,1E-01 | 690 | < 1,0E-05 | 990 | < 1,0E-05 | 1650 | 1,4E-03 | 3150 | 9,6E-03 | 4650 | 1,9E-05 |
| 400 | 2,6E-01 | 700 | < 1,0E-05 | 1000 | < 1,0E-05 | 1700 | 4,4E-03 | 3200 | 7,3E-03 | 4700 | 4,7E-05 |
| 410 | 2,9E-01 | 710 | < 1,0E-05 | 1010 | < 1,0E-05 | 1750 | 1,1E-02 | 3250 | 5,8E-03 | 4750 | 9,5E-05 |
| 420 | 3,0E-01 | 720 | < 1,0E-05 | 1020 | < 1,0E-05 | 1800 | 2,4E-02 | 3300 | 4,9E-03 | 4800 | 1,6E-04 |
| 430 | 3,1E-01 | 730 | < 1,0E-05 | 1030 | < 1,0E-05 | 1850 | 4,4E-02 | 3350 | 4,5E-03 | 4850 | 2,4E-04 |
| 440 | 3,2E-01 | 740 | < 1,0E-05 | 1040 | < 1,0E-05 | 1900 | 7,2E-02 | 3400 | 4,3E-03 | 4900 | 3,3E-04 |
| 450 | 3,4E-01 | 750 | < 1,0E-05 | 1050 | < 1,0E-05 | 1950 | 1,1E-01 | 3450 | 4,4E-03 | 4950 | 3,9E-04 |
| 460 | 3,7E-01 | 760 | < 1,0E-05 | 1060 | < 1,0E-05 | 2000 | 1,5E-01 | 3500 | 4,7E-03 | 5000 | 3,8E-04 |
| 470 | 4,1E-01 | 770 | < 1,0E-05 | 1070 | < 1,0E-05 | 2050 | 1,9E-01 | 3550 | 5,4E-03 | 5050 | 2,8E-04 |
| 480 | 4,6E-01 | 780 | < 1,0E-05 | 1080 | < 1,0E-05 | 2100 | 2,4E-01 | 3600 | 6,4E-03 | 5100 | 1,5E-04 |
| 490 | 5,2E-01 | 790 | < 1,0E-05 | 1090 | < 1,0E-05 | 2150 | 2,9E-01 | 3650 | 7,7E-03 | 5150 | 5,3E-05 |

# S-8023

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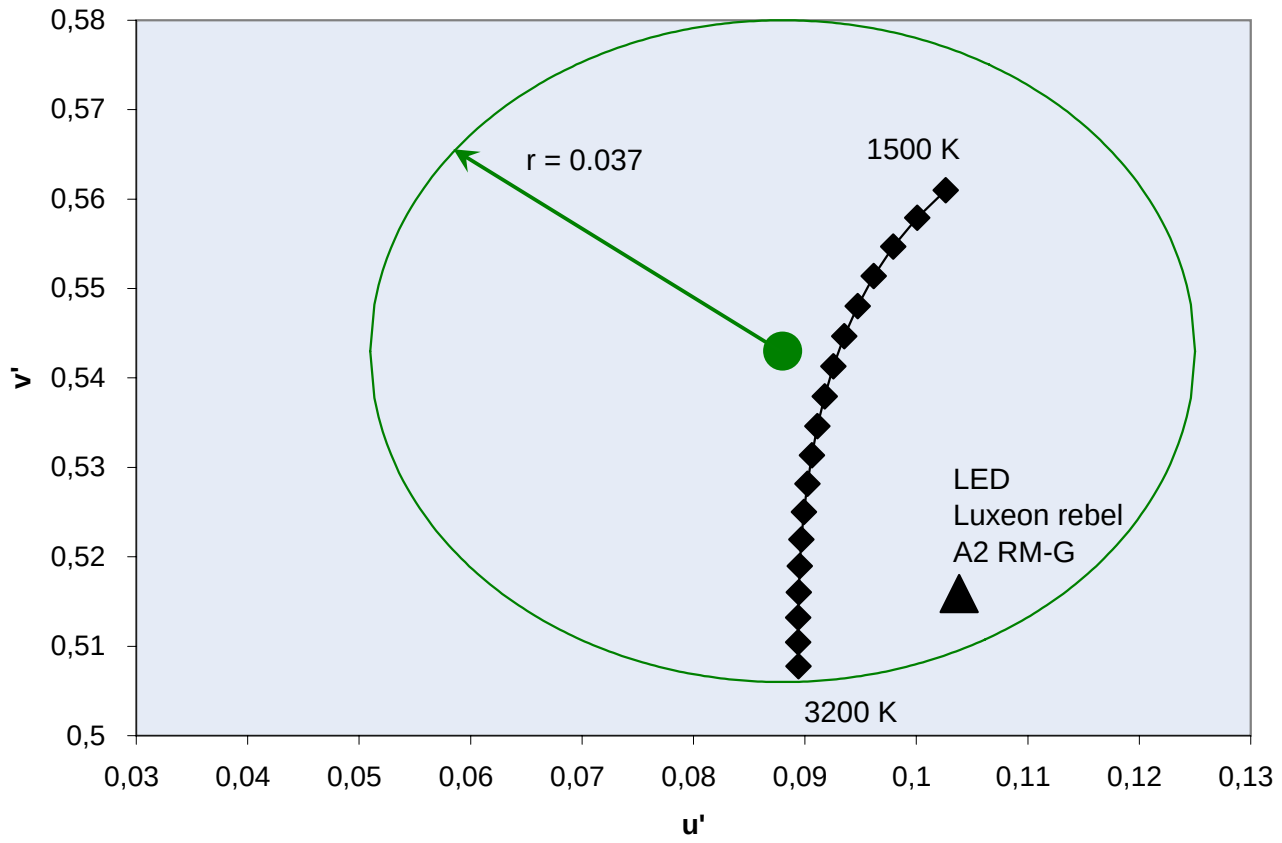
**Chromaticity dependence on Incandescent Color Temperature**




| Chromaticity and NVIS Radiance at thickness d = 3 mm | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Planck [K]** | | **u'** | **v'** | **x** | **y** | **Y** | **$NR_A$** |
| | 1500 | 0,103 | 0,561 | 0,254 | 0,616 | 10,2 | 5,5E-11 |
| | 1600 | 0,100 | 0,558 | 0,245 | 0,607 | 11,2 | 5,3E-11 |
| | 1700 | 0,098 | 0,555 | 0,237 | 0,598 | 12,2 | 5,1E-11 |
| | 1800 | 0,096 | 0,551 | 0,231 | 0,587 | 13,0 | 4,9E-11 |
| | 1900 | 0,095 | 0,548 | 0,224 | 0,577 | 13,8 | 4,8E-11 |
| | 2000 | 0,094 | 0,545 | 0,219 | 0,566 | 14,6 | 4,7E-11 |
| | 2100 | 0,093 | 0,541 | 0,214 | 0,556 | 15,3 | 4,6E-11 |
| | 2200 | 0,092 | 0,538 | 0,209 | 0,546 | 15,9 | 4,6E-11 |
| | 2300 | 0,091 | 0,535 | 0,205 | 0,536 | 16,6 | 4,5E-11 |
| | 2400 | 0,091 | 0,531 | 0,202 | 0,526 | 17,1 | 4,4E-11 |
| | 2500 | 0,090 | 0,528 | 0,198 | 0,516 | 17,7 | 4,4E-11 |
| | 2600 | 0,090 | 0,525 | 0,196 | 0,507 | 18,2 | 4,3E-11 |
| | 2700 | 0,090 | 0,522 | 0,193 | 0,499 | 18,6 | 4,3E-11 |
| | 2800 | 0,090 | 0,519 | 0,190 | 0,490 | 19,1 | 4,3E-11 |
| | 2900 | 0,089 | 0,516 | 0,188 | 0,482 | 19,5 | 4,2E-11 |
| | 3000 | 0,089 | 0,513 | 0,186 | 0,475 | 19,9 | 4,2E-11 |
| | 3100 | 0,089 | 0,510 | 0,184 | 0,467 | 20,2 | 4,2E-11 |
| | 3200 | 0,089 | 0,508 | 0,182 | 0,460 | 20,6 | 4,2E-11 |
| **LED** | | **u'** | **v'** | **x** | **y** | **Y** | **$NR_A$** |
| LUXEON rebel A2-RM-G | | 0,104 | 0,516 | 0,214 | 0,472 | 23,0 | 4,0E-11 |
| **other sources of illumination** | | A service for calculating chromaticity or NVIS radiance can be provided | | | | | |

**NVIS Green A**

**Chromaticity coodinates (as defined by MIL-STD-3009)**

**u' = 0.088**
**v' = 0.543**

**with radius of tolerance r = 0.037**

# Data Sheet

## S-8612

| Reflection factor | |
|---|---|
| $P_d$ | 0,913 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λ (τi = τi,max) [nm] | = | 500 | ± 5 |
| τi, max | ≥ | 0,96 | |
| τi (600 nm) | ≥ | 0,48 | |
| τi (700 nm) | < | 0,02 | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587,6 | He | 1,54 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2,68 |

| Bubble content | |
|---|---|
| Bubble class | 1 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 3.0 |
| AR class | 3.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 404 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9,5 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_k$ [nm/°C] | |

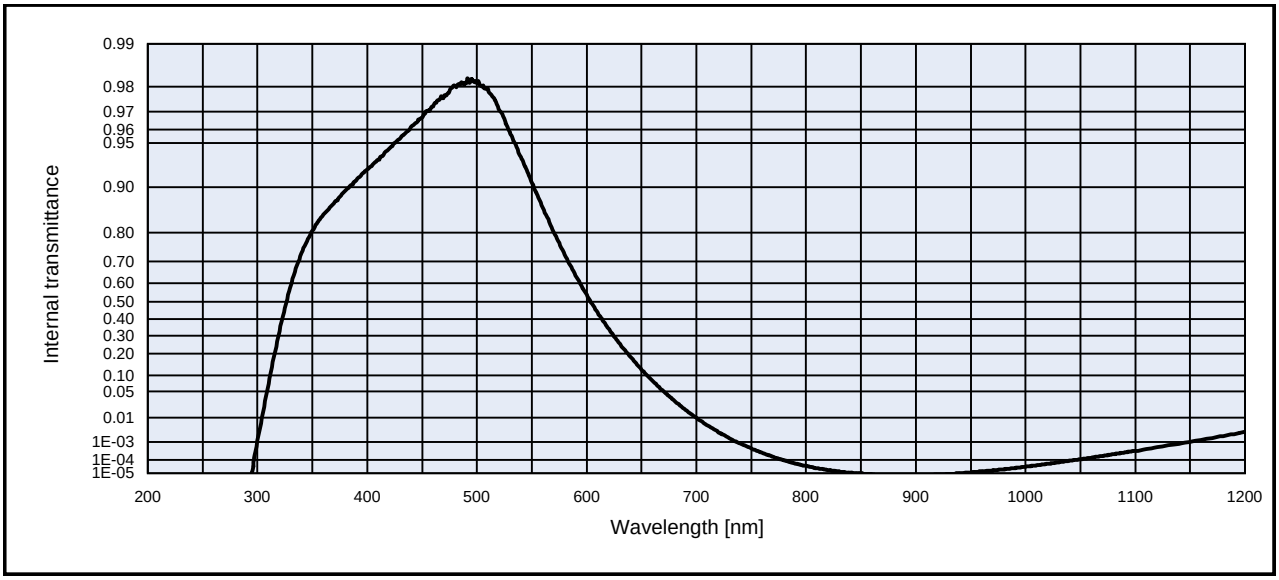
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Band pass filter / short pass filter |
| Color compensating filter / IR cut filter |
| |
| |
| |
| |
| |
| [!!] |
| protective coatings recommended |
| Long-term changes in the polished |
| surface are possible |
| |
| |
| |
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section -Spectral values guaranteed-.** |

**Colorimetric evaluation**

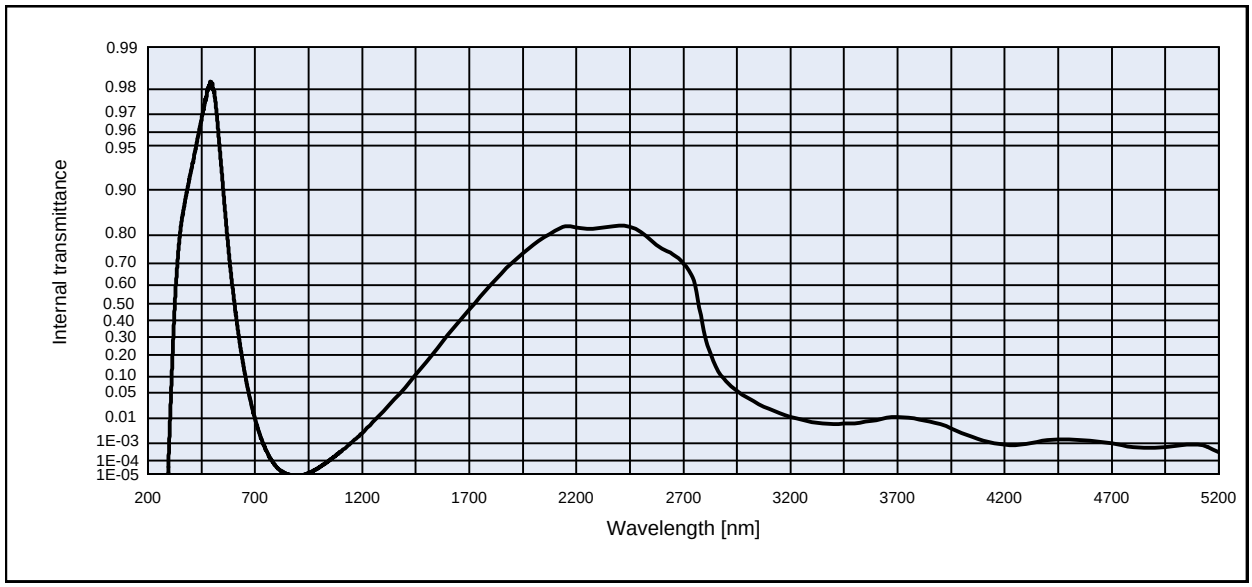
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0,356 | 0,301 | 0,265 |
| y | 0,433 | 0,440 | 0,440 |
| Y | 65 | 52 | 44 |
| $\lambda_d$ [nm] | 500 | 499 | 498 |
| $P_e$ | 0,21 | 0,34 | 0,42 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0,335 | 0,284 | 0,250 |
| y | 0,417 | 0,419 | 0,415 |
| Y | 66 | 54 | 46 |
| $\lambda_d$ [nm] | 498 | 497 | 496 |
| $P_e$ | 0,21 | 0,34 | 0,43 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0,251 | 0,218 | 0,198 |
| y | 0,321 | 0,311 | 0,302 |
| Y | 72 | 62 | 54 |
| $\lambda_d$ [nm] | 490 | 489 | 489 |
| $P_e$ | 0,23 | 0,36 | 0,44 |



# S-8612




**Internal transmittance τi at reference thickness d = 1 mm**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1,0E-05 | 500 | 9,8E-01 | 800 | 3,7E-05 | 1100 | 3,5E-04 | 2200 | 8,2E-01 | 3700 | 1,1E-02 |
| 210 | < 1,0E-05 | 510 | 9,8E-01 | 810 | 2,5E-05 | 1110 | 4,4E-04 | 2250 | 8,2E-01 | 3750 | 1,0E-02 |
| 220 | < 1,0E-05 | 520 | 9,7E-01 | 820 | 1,8E-05 | 1120 | 5,5E-04 | 2300 | 8,2E-01 | 3800 | 9,1E-03 |
| 230 | < 1,0E-05 | 530 | 9,6E-01 | 830 | 1,4E-05 | 1130 | 6,9E-04 | 2350 | 8,2E-01 | 3850 | 7,9E-03 |
| 240 | < 1,0E-05 | 540 | 9,4E-01 | 840 | 1,1E-05 | 1140 | 8,5E-04 | 2400 | 8,3E-01 | 3900 | 6,3E-03 |
| 250 | < 1,0E-05 | 550 | 9,1E-01 | 850 | < 1,0E-05 | 1150 | 1,1E-03 | 2450 | 8,2E-01 | 3950 | 4,3E-03 |
| 260 | < 1,0E-05 | 560 | 8,6E-01 | 860 | < 1,0E-05 | 1160 | 1,3E-03 | 2500 | 8,1E-01 | 4000 | 2,9E-03 |
| 270 | < 1,0E-05 | 570 | 8,0E-01 | 870 | < 1,0E-05 | 1170 | 1,6E-03 | 2550 | 7,8E-01 | 4050 | 1,9E-03 |
| 280 | < 1,0E-05 | 580 | 7,3E-01 | 880 | < 1,0E-05 | 1180 | 1,9E-03 | 2600 | 7,6E-01 | 4100 | 1,3E-03 |
| 290 | < 1,0E-05 | 590 | 6,4E-01 | 890 | < 1,0E-05 | 1190 | 2,4E-03 | 2650 | 7,4E-01 | 4150 | 9,9E-04 |
| 300 | 1,2E-03 | 600 | 5,4E-01 | 900 | < 1,0E-05 | 1200 | 2,9E-03 | 2700 | 7,0E-01 | 4200 | 8,2E-04 |
| 310 | 7,0E-02 | 610 | 4,4E-01 | 910 | < 1,0E-05 | 1250 | 7,4E-03 | 2750 | 6,2E-01 | 4250 | 8,1E-04 |
| 320 | 3,3E-01 | 620 | 3,4E-01 | 920 | < 1,0E-05 | 1300 | 1,7E-02 | 2800 | 3,1E-01 | 4300 | 8,9E-04 |
| 330 | 5,8E-01 | 630 | 2,5E-01 | 930 | < 1,0E-05 | 1350 | 3,5E-02 | 2850 | 1,4E-01 | 4350 | 1,1E-03 |
| 340 | 7,3E-01 | 640 | 1,8E-01 | 940 | < 1,0E-05 | 1400 | 6,3E-02 | 2900 | 8,2E-02 | 4400 | 1,4E-03 |
| 350 | 8,1E-01 | 650 | 1,2E-01 | 950 | 1,2E-05 | 1450 | 1,1E-01 | 2950 | 5,3E-02 | 4450 | 1,5E-03 |
| 360 | 8,5E-01 | 660 | 8,0E-02 | 960 | 1,4E-05 | 1500 | 1,6E-01 | 3000 | 3,7E-02 | 4500 | 1,5E-03 |
| 370 | 8,7E-01 | 670 | 5,0E-02 | 970 | 1,7E-05 | 1550 | 2,3E-01 | 3050 | 2,7E-02 | 4550 | 1,4E-03 |
| 380 | 8,9E-01 | 680 | 3,0E-02 | 980 | 2,1E-05 | 1600 | 3,1E-01 | 3100 | 1,9E-02 | 4600 | 1,3E-03 |
| 390 | 9,1E-01 | 690 | 1,7E-02 | 990 | 2,6E-05 | 1650 | 3,9E-01 | 3150 | 1,4E-02 | 4650 | 1,1E-03 |
| 400 | 9,2E-01 | 700 | 9,7E-03 | 1000 | 3,3E-05 | 1700 | 4,7E-01 | 3200 | 1,1E-02 | 4700 | 9,5E-04 |
| 410 | 9,4E-01 | 710 | 5,3E-03 | 1010 | 4,1E-05 | 1750 | 5,4E-01 | 3250 | 9,2E-03 | 4750 | 7,7E-04 |
| 420 | 9,5E-01 | 720 | 2,9E-03 | 1020 | 5,2E-05 | 1800 | 6,0E-01 | 3300 | 7,5E-03 | 4800 | 6,4E-04 |
| 430 | 9,5E-01 | 730 | 1,6E-03 | 1030 | 6,6E-05 | 1850 | 6,6E-01 | 3350 | 6,8E-03 | 4850 | 5,7E-04 |
| 440 | 9,6E-01 | 740 | 8,7E-04 | 1040 | 8,5E-05 | 1900 | 7,0E-01 | 3400 | 6,4E-03 | 4900 | 5,7E-04 |
| 450 | 9,7E-01 | 750 | 4,7E-04 | 1050 | 1,1E-04 | 1950 | 7,4E-01 | 3450 | 6,6E-03 | 4950 | 6,4E-04 |
| 460 | 9,7E-01 | 760 | 2,7E-04 | 1060 | 1,4E-04 | 2000 | 7,7E-01 | 3500 | 6,9E-03 | 5000 | 7,5E-04 |
| 470 | 9,8E-01 | 770 | 1,5E-04 | 1070 | 1,7E-04 | 2050 | 7,9E-01 | 3550 | 8,0E-03 | 5050 | 8,5E-04 |
| 480 | 9,8E-01 | 780 | 9,1E-05 | 1080 | 2,2E-04 | 2100 | 8,1E-01 | 3600 | 8,9E-03 | 5100 | 8,5E-04 |
| 490 | 9,8E-01 | 790 | 5,6E-05 | 1090 | 2,8E-04 | 2150 | 8,2E-01 | 3650 | 1,0E-02 | 5150 | 6,3E-04 |

# Data Sheet

SCHOTT

## VG9

| Density | |
|---|---|
| ρ [g/cm³] | 2.87 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.91 |

| Bubble content | |
|---|---|
| Bubble class | 1 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (450 nm) | ≤ | 0.21 |
| τi (514 nm) | ≥ | 0.67 |
| τi (633 nm) | ≤ | 0.15 |
| τi (725 nm) | ≤ | 0.07 |
| τi (1060 nm) | ≤ | 0.18 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 462 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 9.2 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 10.6 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 480 | Cd | 1.56 |
| 587.6 | He | 1.55 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |

**Notes**

Ionically colored glass

Band pass filter

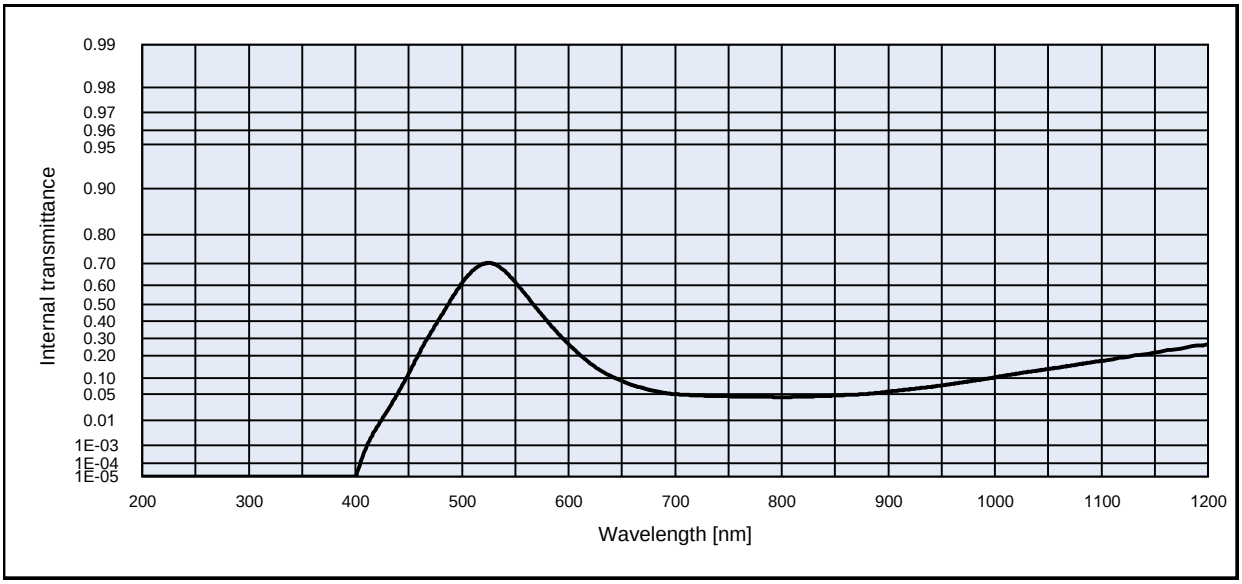
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.370 | 0.306 | 0.265 |
| y | 0.522 | 0.596 | 0.645 |
| Y | 40 | 21 | 12 |
| $\lambda_d$ [nm] | 535 | 529 | 527 |
| $P_e$ | 0.31 | 0.47 | 0.58 |

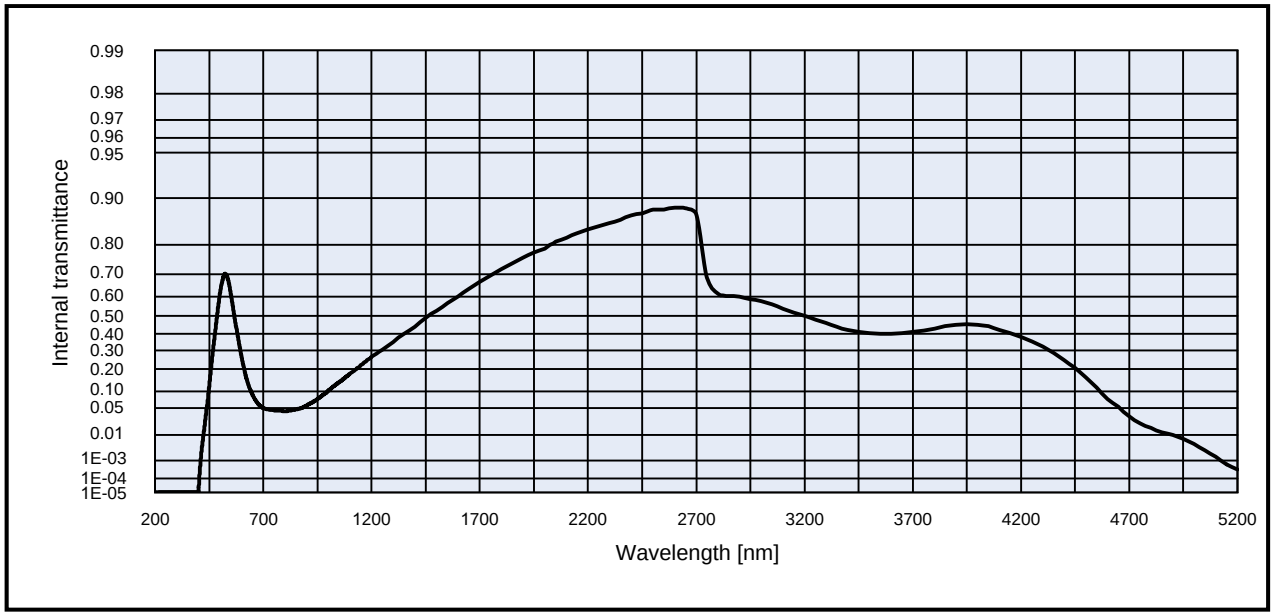
| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.354 | 0.295 | 0.256 |
| y | 0.521 | 0.596 | 0.645 |
| Y | 41 | 22 | 13 |
| $\lambda_d$ [nm] | 538 | 531 | 528 |
| $P_e$ | 0.33 | 0.49 | 0.59 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.284 | 0.246 | 0.220 |
| y | 0.493 | 0.582 | 0.637 |
| Y | 45 | 25 | 15 |
| $\lambda_d$ [nm] | 541 | 535 | 532 |
| $P_e$ | 0.39 | 0.56 | 0.66 |



# VG9

SCHOTT




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 6.1E-01 | 800 | 4.3E-02 | 1100 | 1.7E-01 | 2200 | 8.4E-01 | 3700 | 4.1E-01 |
| 210 | < 1.0E-05 | 510 | 6.7E-01 | 810 | 4.3E-02 | 1110 | 1.8E-01 | 2250 | 8.5E-01 | 3750 | 4.2E-01 |
| 220 | < 1.0E-05 | 520 | 7.0E-01 | 820 | 4.4E-02 | 1120 | 1.9E-01 | 2300 | 8.5E-01 | 3800 | 4.3E-01 |
| 230 | < 1.0E-05 | 530 | 7.0E-01 | 830 | 4.5E-02 | 1130 | 2.0E-01 | 2350 | 8.6E-01 | 3850 | 4.4E-01 |
| 240 | < 1.0E-05 | 540 | 6.7E-01 | 840 | 4.5E-02 | 1140 | 2.1E-01 | 2400 | 8.7E-01 | 3900 | 4.5E-01 |
| 250 | < 1.0E-05 | 550 | 6.2E-01 | 850 | 4.7E-02 | 1150 | 2.2E-01 | 2450 | 8.7E-01 | 3950 | 4.5E-01 |
| 260 | < 1.0E-05 | 560 | 5.5E-01 | 860 | 4.8E-02 | 1160 | 2.3E-01 | 2500 | 8.8E-01 | 4000 | 4.5E-01 |
| 270 | < 1.0E-05 | 570 | 4.8E-01 | 870 | 4.9E-02 | 1170 | 2.4E-01 | 2550 | 8.8E-01 | 4050 | 4.4E-01 |
| 280 | < 1.0E-05 | 580 | 4.0E-01 | 880 | 5.0E-02 | 1180 | 2.5E-01 | 2600 | 8.8E-01 | 4100 | 4.2E-01 |
| 290 | < 1.0E-05 | 590 | 3.3E-01 | 890 | 5.3E-02 | 1190 | 2.6E-01 | 2650 | 8.8E-01 | 4150 | 4.0E-01 |
| 300 | < 1.0E-05 | 600 | 2.7E-01 | 900 | 5.6E-02 | 1200 | 2.6E-01 | 2700 | 8.7E-01 | 4200 | 3.8E-01 |
| 310 | < 1.0E-05 | 610 | 2.1E-01 | 910 | 5.9E-02 | 1250 | 3.0E-01 | 2750 | 6.9E-01 | 4250 | 3.5E-01 |
| 320 | < 1.0E-05 | 620 | 1.6E-01 | 920 | 6.3E-02 | 1300 | 3.5E-01 | 2800 | 6.2E-01 | 4300 | 3.2E-01 |
| 330 | < 1.0E-05 | 630 | 1.3E-01 | 930 | 6.6E-02 | 1350 | 4.0E-01 | 2850 | 6.1E-01 | 4350 | 2.9E-01 |
| 340 | < 1.0E-05 | 640 | 1.1E-01 | 940 | 7.0E-02 | 1400 | 4.4E-01 | 2900 | 6.0E-01 | 4400 | 2.5E-01 |
| 350 | < 1.0E-05 | 650 | 8.9E-02 | 950 | 7.4E-02 | 1450 | 4.9E-01 | 2950 | 5.9E-01 | 4450 | 2.1E-01 |
| 360 | < 1.0E-05 | 660 | 7.5E-02 | 960 | 7.9E-02 | 1500 | 5.3E-01 | 3000 | 5.8E-01 | 4500 | 1.6E-01 |
| 370 | < 1.0E-05 | 670 | 6.6E-02 | 970 | 8.4E-02 | 1550 | 5.7E-01 | 3050 | 5.6E-01 | 4550 | 1.1E-01 |
| 380 | < 1.0E-05 | 680 | 5.8E-02 | 980 | 9.0E-02 | 1600 | 6.0E-01 | 3100 | 5.4E-01 | 4600 | 7.5E-02 |
| 390 | < 1.0E-05 | 690 | 5.3E-02 | 990 | 9.5E-02 | 1650 | 6.4E-01 | 3150 | 5.2E-01 | 4650 | 5.2E-02 |
| 400 | < 1.0E-05 | 700 | 5.0E-02 | 1000 | 1.0E-01 | 1700 | 6.7E-01 | 3200 | 5.0E-01 | 4700 | 3.3E-02 |
| 410 | 7.6E-04 | 710 | 4.8E-02 | 1010 | 1.1E-01 | 1750 | 7.0E-01 | 3250 | 4.8E-01 | 4750 | 2.2E-02 |
| 420 | 5.7E-03 | 720 | 4.7E-02 | 1020 | 1.2E-01 | 1800 | 7.2E-01 | 3300 | 4.6E-01 | 4800 | 1.6E-02 |
| 430 | 2.0E-02 | 730 | 4.6E-02 | 1030 | 1.2E-01 | 1850 | 7.4E-01 | 3350 | 4.4E-01 | 4850 | 1.2E-02 |
| 440 | 5.3E-02 | 740 | 4.5E-02 | 1040 | 1.3E-01 | 1900 | 7.6E-01 | 3400 | 4.2E-01 | 4900 | 1.0E-02 |
| 450 | 1.2E-01 | 750 | 4.5E-02 | 1050 | 1.4E-01 | 1950 | 7.8E-01 | 3450 | 4.1E-01 | 4950 | 7.5E-03 |
| 460 | 2.2E-01 | 760 | 4.4E-02 | 1060 | 1.4E-01 | 2000 | 7.9E-01 | 3500 | 4.0E-01 | 5000 | 5.0E-03 |
| 470 | 3.3E-01 | 770 | 4.4E-02 | 1070 | 1.5E-01 | 2050 | 8.1E-01 | 3550 | 4.0E-01 | 5050 | 2.8E-03 |
| 480 | 4.3E-01 | 780 | 4.4E-02 | 1080 | 1.6E-01 | 2100 | 8.2E-01 | 3600 | 4.0E-01 | 5100 | 1.5E-03 |
| 490 | 5.3E-01 | 790 | 4.3E-02 | 1090 | 1.7E-01 | 2150 | 8.3E-01 | 3650 | 4.0E-01 | 5150 | 6.6E-04 |

# Data Sheet

SCHOTT

## GG395

| Density | |
|---|---|
| ρ [g/cm³] | 2.55 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 395 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 340 | |
| λp (τip = 0.92) [nm] | = | 480 | |

| Transformation temperature | |
|---|---|
| Tg [°C] | 538 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.8 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.0 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 546 | Hg | 1.52 |
| 587.6 | He | 1.52 |
| 852.1 | Cs | 1.52 |
| 1014 | Hg | 1.51 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.07 |

**Notes**

Colloidally colored glass

Long pass filter

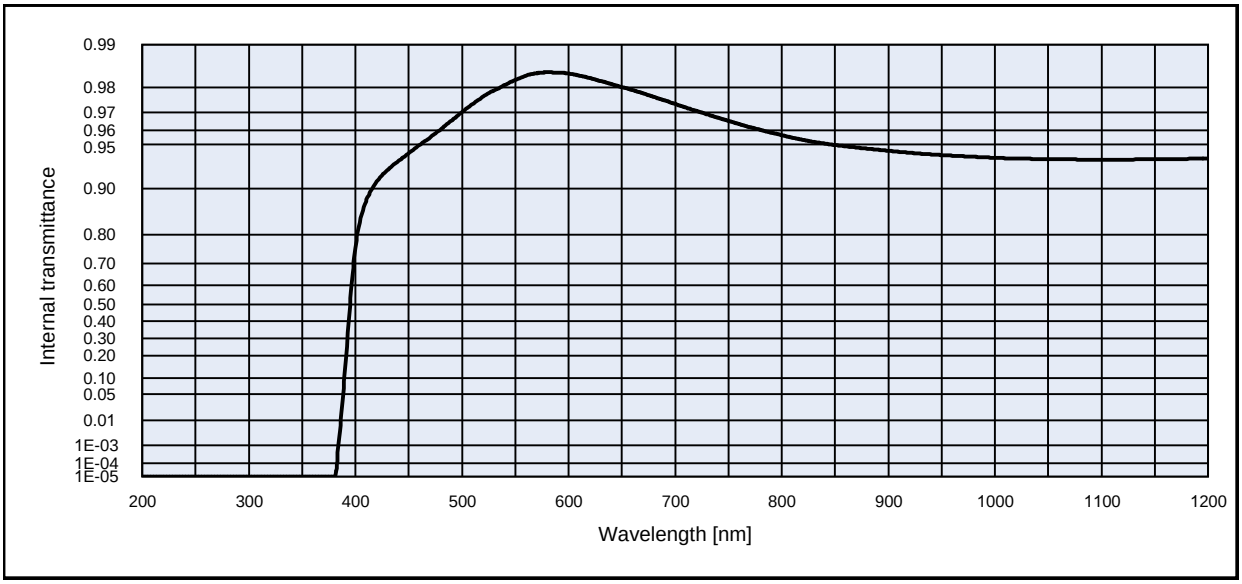
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

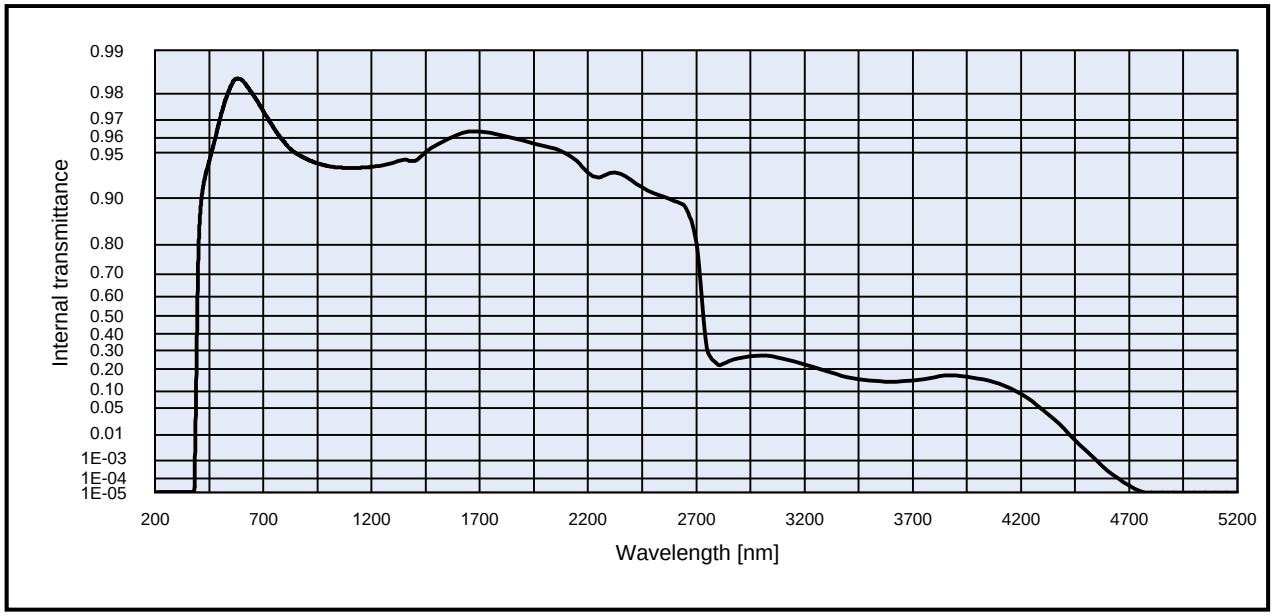
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.448 | 0.449 | 0.450 |
| y | 0.408 | 0.409 | 0.410 |
| Y | 91 | 91 | 90 |
| $\lambda_d$ [nm] | 581 | 581 | 581 |
| $P_e$ | 0.01 | 0.02 | 0.03 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.424 | 0.425 | 0.426 |
| y | 0.400 | 0.401 | 0.402 |
| Y | 91 | 91 | 90 |
| $\lambda_d$ [nm] | 579 | 579 | 579 |
| $P_e$ | 0.01 | 0.02 | 0.03 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.314 | 0.315 | 0.316 |
| y | 0.331 | 0.332 | 0.334 |
| Y | 91 | 90 | 90 |
| $\lambda_d$ [nm] | 570 | 570 | 571 |
| $P_e$ | 0.01 | 0.02 | 0.02 |



# GG395




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.7E-01 | 800 | 9.6E-01 | 1100 | 9.4E-01 | 2200 | 9.3E-01 | 3700 | 1.4E-01 |
| 210 | < 1.0E-05 | 510 | 9.7E-01 | 810 | 9.6E-01 | 1110 | 9.4E-01 | 2250 | 9.3E-01 | 3750 | 1.5E-01 |
| 220 | < 1.0E-05 | 520 | 9.8E-01 | 820 | 9.5E-01 | 1120 | 9.4E-01 | 2300 | 9.3E-01 | 3800 | 1.6E-01 |
| 230 | < 1.0E-05 | 530 | 9.8E-01 | 830 | 9.5E-01 | 1130 | 9.4E-01 | 2350 | 9.3E-01 | 3850 | 1.7E-01 |
| 240 | < 1.0E-05 | 540 | 9.8E-01 | 840 | 9.5E-01 | 1140 | 9.4E-01 | 2400 | 9.2E-01 | 3900 | 1.7E-01 |
| 250 | < 1.0E-05 | 550 | 9.8E-01 | 850 | 9.5E-01 | 1150 | 9.4E-01 | 2450 | 9.1E-01 | 3950 | 1.6E-01 |
| 260 | < 1.0E-05 | 560 | 9.8E-01 | 860 | 9.5E-01 | 1160 | 9.4E-01 | 2500 | 9.1E-01 | 4000 | 1.5E-01 |
| 270 | < 1.0E-05 | 570 | 9.8E-01 | 870 | 9.5E-01 | 1170 | 9.4E-01 | 2550 | 9.0E-01 | 4050 | 1.4E-01 |
| 280 | < 1.0E-05 | 580 | 9.8E-01 | 880 | 9.5E-01 | 1180 | 9.4E-01 | 2600 | 9.0E-01 | 4100 | 1.3E-01 |
| 290 | < 1.0E-05 | 590 | 9.8E-01 | 890 | 9.5E-01 | 1190 | 9.4E-01 | 2650 | 8.8E-01 | 4150 | 1.1E-01 |
| 300 | < 1.0E-05 | 600 | 9.8E-01 | 900 | 9.4E-01 | 1200 | 9.4E-01 | 2700 | 8.0E-01 | 4200 | 9.2E-02 |
| 310 | < 1.0E-05 | 610 | 9.8E-01 | 910 | 9.4E-01 | 1250 | 9.4E-01 | 2750 | 3.2E-01 | 4250 | 6.8E-02 |
| 320 | < 1.0E-05 | 620 | 9.8E-01 | 920 | 9.4E-01 | 1300 | 9.4E-01 | 2800 | 2.2E-01 | 4300 | 4.6E-02 |
| 330 | < 1.0E-05 | 630 | 9.8E-01 | 930 | 9.4E-01 | 1350 | 9.4E-01 | 2850 | 2.4E-01 | 4350 | 2.9E-02 |
| 340 | < 1.0E-05 | 640 | 9.8E-01 | 940 | 9.4E-01 | 1400 | 9.4E-01 | 2900 | 2.6E-01 | 4400 | 1.6E-02 |
| 350 | < 1.0E-05 | 650 | 9.8E-01 | 950 | 9.4E-01 | 1450 | 9.5E-01 | 2950 | 2.7E-01 | 4450 | 6.9E-03 |
| 360 | < 1.0E-05 | 660 | 9.8E-01 | 960 | 9.4E-01 | 1500 | 9.6E-01 | 3000 | 2.7E-01 | 4500 | 2.8E-03 |
| 370 | < 1.0E-05 | 670 | 9.8E-01 | 970 | 9.4E-01 | 1550 | 9.6E-01 | 3050 | 2.7E-01 | 4550 | 9.9E-04 |
| 380 | < 1.0E-05 | 680 | 9.8E-01 | 980 | 9.4E-01 | 1600 | 9.6E-01 | 3100 | 2.6E-01 | 4600 | 3.0E-04 |
| 390 | 1.1E-01 | 690 | 9.8E-01 | 990 | 9.4E-01 | 1650 | 9.6E-01 | 3150 | 2.4E-01 | 4650 | 9.9E-05 |
| 400 | 7.6E-01 | 700 | 9.7E-01 | 1000 | 9.4E-01 | 1700 | 9.6E-01 | 3200 | 2.2E-01 | 4700 | 3.3E-05 |
| 410 | 8.8E-01 | 710 | 9.7E-01 | 1010 | 9.4E-01 | 1750 | 9.6E-01 | 3250 | 2.1E-01 | 4750 | 1.2E-05 |
| 420 | 9.1E-01 | 720 | 9.7E-01 | 1020 | 9.4E-01 | 1800 | 9.6E-01 | 3300 | 1.9E-01 | 4800 | < 1.0E-05 |
| 430 | 9.3E-01 | 730 | 9.7E-01 | 1030 | 9.4E-01 | 1850 | 9.6E-01 | 3350 | 1.7E-01 | 4850 | < 1.0E-05 |
| 440 | 9.3E-01 | 740 | 9.7E-01 | 1040 | 9.4E-01 | 1900 | 9.6E-01 | 3400 | 1.6E-01 | 4900 | < 1.0E-05 |
| 450 | 9.4E-01 | 750 | 9.7E-01 | 1050 | 9.4E-01 | 1950 | 9.6E-01 | 3450 | 1.5E-01 | 4950 | < 1.0E-05 |
| 460 | 9.5E-01 | 760 | 9.6E-01 | 1060 | 9.4E-01 | 2000 | 9.5E-01 | 3500 | 1.4E-01 | 5000 | < 1.0E-05 |
| 470 | 9.6E-01 | 770 | 9.6E-01 | 1070 | 9.4E-01 | 2050 | 9.5E-01 | 3550 | 1.4E-01 | 5050 | < 1.0E-05 |
| 480 | 9.6E-01 | 780 | 9.6E-01 | 1080 | 9.4E-01 | 2100 | 9.5E-01 | 3600 | 1.4E-01 | 5100 | < 1.0E-05 |
| 490 | 9.7E-01 | 790 | 9.6E-01 | 1090 | 9.4E-01 | 2150 | 9.4E-01 | 3650 | 1.4E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## GG400

| Density | |
|---|---|
| ρ [g/cm³] | 2.55 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 400 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 340 | |
| λp (τip = 0.93) [nm] | = | 480 | |

| Transformation temperature | |
|---|---|
| Tg [°C] | 537 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.9 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.1 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 546 | Hg | 1.53 |
| 587.6 | He | 1.52 |
| 852.1 | Cs | 1.52 |
| 1014 | Hg | 1.51 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.07 |

**Notes**

Colloidally colored glass

Long pass filter

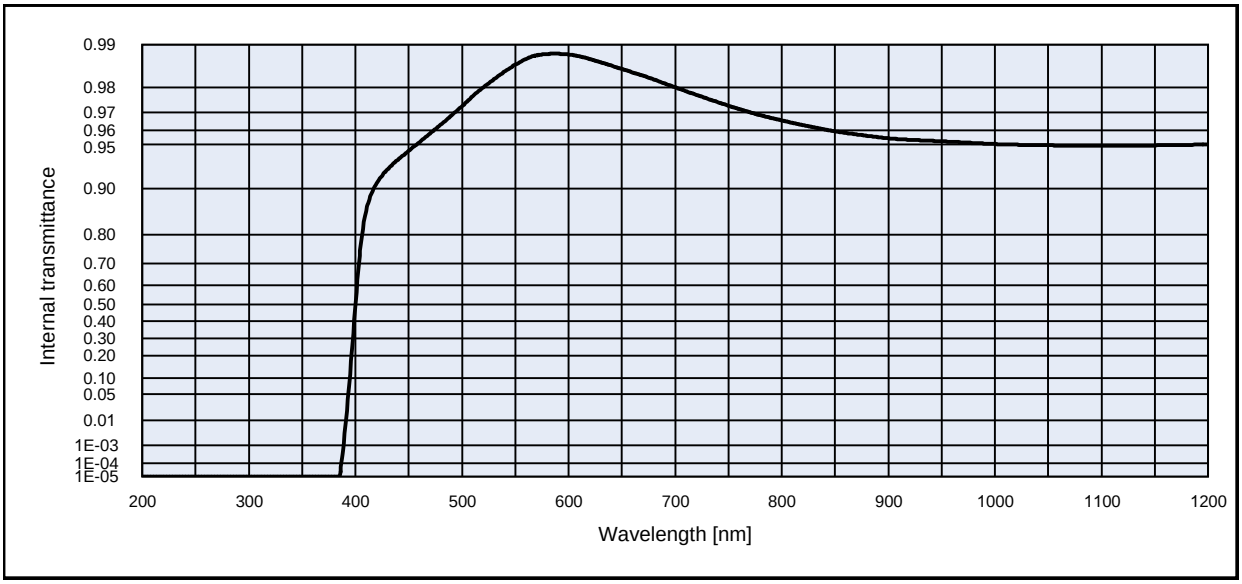
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

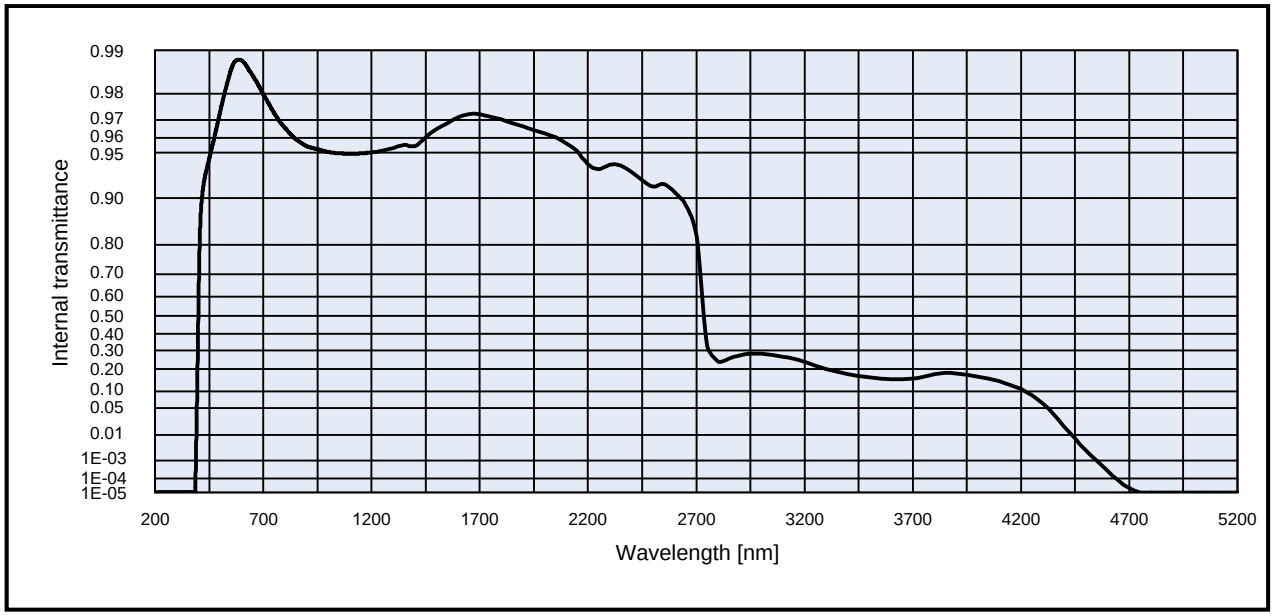
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.448 | 0.449 | 0.450 |
| y | 0.408 | 0.409 | 0.410 |
| Y | 91 | 91 | 90 |
| $\lambda_d$ [nm] | 581 | 581 | 581 |
| $P_e$ | 0.01 | 0.02 | 0.03 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.424 | 0.425 | 0.426 |
| y | 0.400 | 0.401 | 0.402 |
| Y | 91 | 91 | 90 |
| $\lambda_d$ [nm] | 579 | 579 | 579 |
| $P_e$ | 0.01 | 0.02 | 0.03 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.314 | 0.315 | 0.316 |
| y | 0.331 | 0.333 | 0.335 |
| Y | 91 | 91 | 90 |
| $\lambda_d$ [nm] | 570 | 571 | 571 |
| $P_e$ | 0.01 | 0.02 | 0.03 |



# GG400




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.7E-01 | 800 | 9.7E-01 | 1100 | 9.5E-01 | 2200 | 9.4E-01 | 3700 | 1.5E-01 |
| 210 | < 1.0E-05 | 510 | 9.8E-01 | 810 | 9.6E-01 | 1110 | 9.5E-01 | 2250 | 9.4E-01 | 3750 | 1.6E-01 |
| 220 | < 1.0E-05 | 520 | 9.8E-01 | 820 | 9.6E-01 | 1120 | 9.5E-01 | 2300 | 9.4E-01 | 3800 | 1.7E-01 |
| 230 | < 1.0E-05 | 530 | 9.8E-01 | 830 | 9.6E-01 | 1130 | 9.5E-01 | 2350 | 9.4E-01 | 3850 | 1.8E-01 |
| 240 | < 1.0E-05 | 540 | 9.8E-01 | 840 | 9.6E-01 | 1140 | 9.5E-01 | 2400 | 9.3E-01 | 3900 | 1.8E-01 |
| 250 | < 1.0E-05 | 550 | 9.9E-01 | 850 | 9.6E-01 | 1150 | 9.5E-01 | 2450 | 9.2E-01 | 3950 | 1.7E-01 |
| 260 | < 1.0E-05 | 560 | 9.9E-01 | 860 | 9.6E-01 | 1160 | 9.5E-01 | 2500 | 9.2E-01 | 4000 | 1.6E-01 |
| 270 | < 1.0E-05 | 570 | 9.9E-01 | 870 | 9.6E-01 | 1170 | 9.5E-01 | 2550 | 9.2E-01 | 4050 | 1.5E-01 |
| 280 | < 1.0E-05 | 580 | 9.9E-01 | 880 | 9.6E-01 | 1180 | 9.5E-01 | 2600 | 9.1E-01 | 4100 | 1.4E-01 |
| 290 | < 1.0E-05 | 590 | 9.9E-01 | 890 | 9.6E-01 | 1190 | 9.5E-01 | 2650 | 8.9E-01 | 4150 | 1.3E-01 |
| 300 | < 1.0E-05 | 600 | 9.9E-01 | 900 | 9.5E-01 | 1200 | 9.5E-01 | 2700 | 8.2E-01 | 4200 | 1.1E-01 |
| 310 | < 1.0E-05 | 610 | 9.9E-01 | 910 | 9.5E-01 | 1250 | 9.5E-01 | 2750 | 3.4E-01 | 4250 | 8.6E-02 |
| 320 | < 1.0E-05 | 620 | 9.9E-01 | 920 | 9.5E-01 | 1300 | 9.5E-01 | 2800 | 2.4E-01 | 4300 | 6.1E-02 |
| 330 | < 1.0E-05 | 630 | 9.9E-01 | 930 | 9.5E-01 | 1350 | 9.6E-01 | 2850 | 2.6E-01 | 4350 | 3.7E-02 |
| 340 | < 1.0E-05 | 640 | 9.9E-01 | 940 | 9.5E-01 | 1400 | 9.5E-01 | 2900 | 2.7E-01 | 4400 | 1.8E-02 |
| 350 | < 1.0E-05 | 650 | 9.9E-01 | 950 | 9.5E-01 | 1450 | 9.6E-01 | 2950 | 2.8E-01 | 4450 | 7.9E-03 |
| 360 | < 1.0E-05 | 660 | 9.8E-01 | 960 | 9.5E-01 | 1500 | 9.7E-01 | 3000 | 2.8E-01 | 4500 | 2.8E-03 |
| 370 | < 1.0E-05 | 670 | 9.8E-01 | 970 | 9.5E-01 | 1550 | 9.7E-01 | 3050 | 2.8E-01 | 4550 | 9.8E-04 |
| 380 | < 1.0E-05 | 680 | 9.8E-01 | 980 | 9.5E-01 | 1600 | 9.7E-01 | 3100 | 2.7E-01 | 4600 | 3.0E-04 |
| 390 | 3.4E-03 | 690 | 9.8E-01 | 990 | 9.5E-01 | 1650 | 9.7E-01 | 3150 | 2.6E-01 | 4650 | 7.3E-05 |
| 400 | 4.9E-01 | 700 | 9.8E-01 | 1000 | 9.5E-01 | 1700 | 9.7E-01 | 3200 | 2.4E-01 | 4700 | 2.2E-05 |
| 410 | 8.6E-01 | 710 | 9.8E-01 | 1010 | 9.5E-01 | 1750 | 9.7E-01 | 3250 | 2.2E-01 | 4750 | < 1.0E-05 |
| 420 | 9.1E-01 | 720 | 9.8E-01 | 1020 | 9.5E-01 | 1800 | 9.7E-01 | 3300 | 2.0E-01 | 4800 | < 1.0E-05 |
| 430 | 9.3E-01 | 730 | 9.8E-01 | 1030 | 9.5E-01 | 1850 | 9.7E-01 | 3350 | 1.9E-01 | 4850 | < 1.0E-05 |
| 440 | 9.4E-01 | 740 | 9.7E-01 | 1040 | 9.5E-01 | 1900 | 9.7E-01 | 3400 | 1.8E-01 | 4900 | < 1.0E-05 |
| 450 | 9.4E-01 | 750 | 9.7E-01 | 1050 | 9.5E-01 | 1950 | 9.6E-01 | 3450 | 1.7E-01 | 4950 | < 1.0E-05 |
| 460 | 9.5E-01 | 760 | 9.7E-01 | 1060 | 9.5E-01 | 2000 | 9.6E-01 | 3500 | 1.6E-01 | 5000 | < 1.0E-05 |
| 470 | 9.6E-01 | 770 | 9.7E-01 | 1070 | 9.5E-01 | 2050 | 9.6E-01 | 3550 | 1.5E-01 | 5050 | < 1.0E-05 |
| 480 | 9.6E-01 | 780 | 9.7E-01 | 1080 | 9.5E-01 | 2100 | 9.6E-01 | 3600 | 1.5E-01 | 5100 | < 1.0E-05 |
| 490 | 9.7E-01 | 790 | 9.7E-01 | 1090 | 9.5E-01 | 2150 | 9.5E-01 | 3650 | 1.5E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## GG420

| Density | |
|---|---|
| ρ [g/cm³] | 2.55 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 420 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 360 | |
| λp (τip = 0.93) [nm] | = | 530 | |

| Transformation temperature | |
|---|---|
| Tg [°C] | 535 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.8 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.0 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 546 | Hg | 1.53 |
| 587.6 | He | 1.52 |
| 852.1 | Cs | 1.52 |
| 1014 | Hg | 1.51 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.07 |

| Notes |
|---|
| |
| Colloidally colored glass |
| |
| Long pass filter |

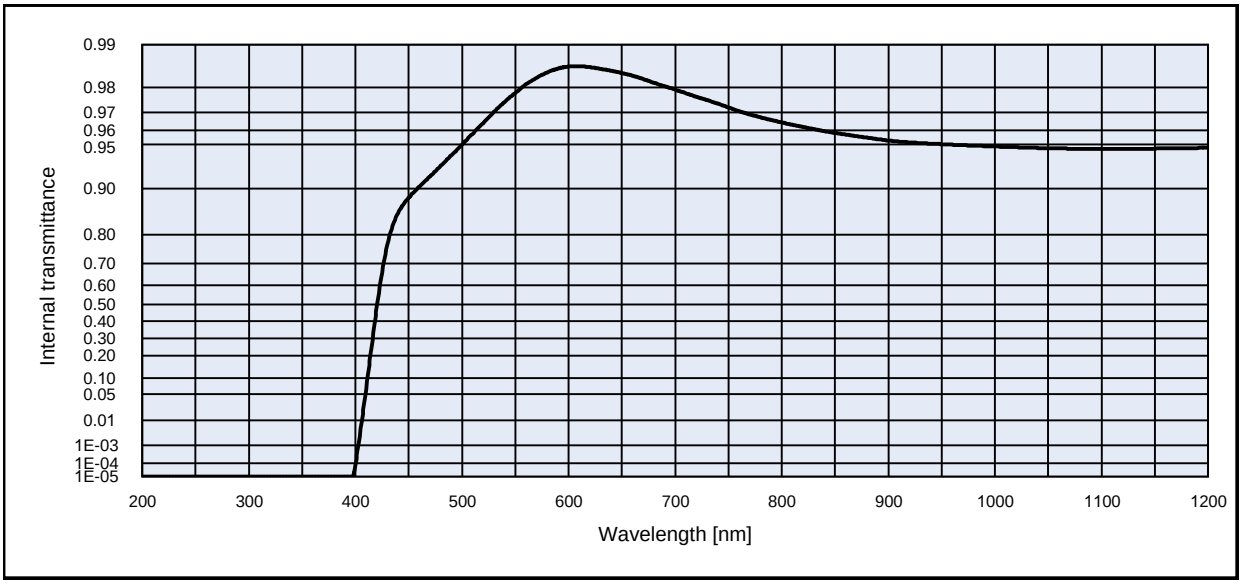
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

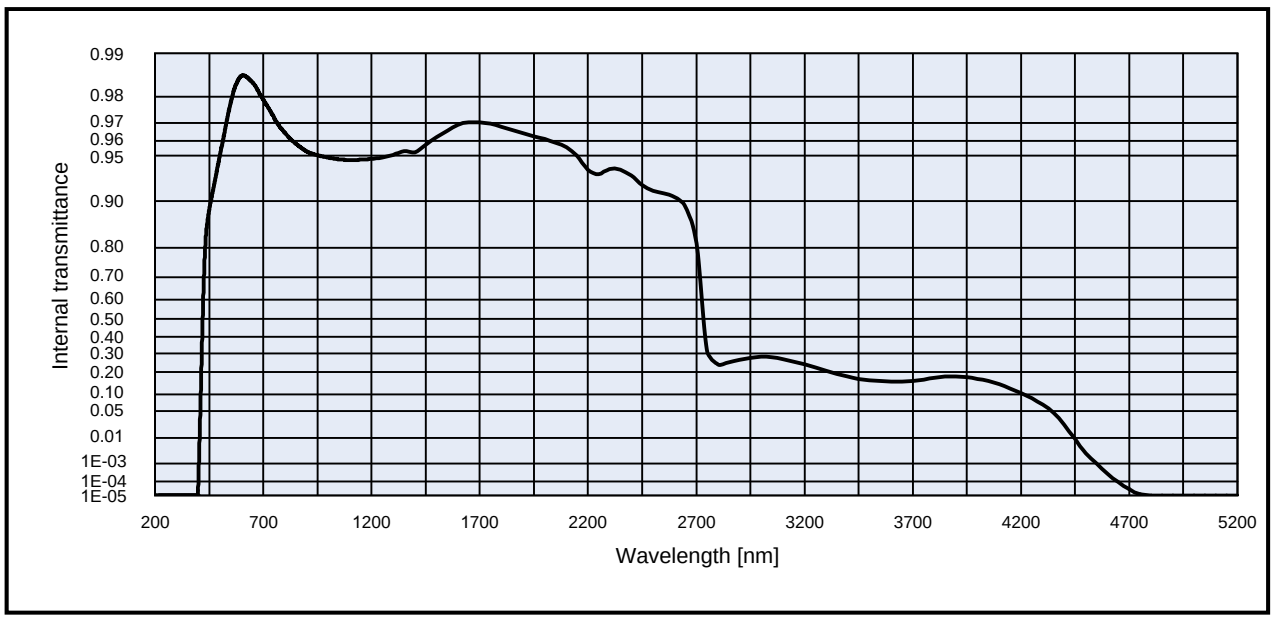
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.450 | 0.453 | 0.455 |
| y | 0.410 | 0.412 | 0.414 |
| Y | 91 | 90 | 90 |
| $\lambda_d$ [nm] | 581 | 581 | 581 |
| $P_e$ | 0.04 | 0.07 | 0.10 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.426 | 0.429 | 0.432 |
| y | 0.403 | 0.405 | 0.408 |
| Y | 91 | 90 | 90 |
| $\lambda_d$ [nm] | 579 | 579 | 579 |
| $P_e$ | 0.04 | 0.07 | 0.10 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.317 | 0.320 | 0.324 |
| y | 0.337 | 0.342 | 0.348 |
| Y | 91 | 90 | 89 |
| $\lambda_d$ [nm] | 569 | 570 | 570 |
| $P_e$ | 0.03 | 0.06 | 0.08 |



# GG420




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.5E-01 | 800 | 9.6E-01 | 1100 | 9.5E-01 | 2200 | 9.4E-01 | 3700 | 1.6E-01 |
| 210 | < 1.0E-05 | 510 | 9.6E-01 | 810 | 9.6E-01 | 1110 | 9.5E-01 | 2250 | 9.3E-01 | 3750 | 1.6E-01 |
| 220 | < 1.0E-05 | 520 | 9.6E-01 | 820 | 9.6E-01 | 1120 | 9.5E-01 | 2300 | 9.4E-01 | 3800 | 1.7E-01 |
| 230 | < 1.0E-05 | 530 | 9.7E-01 | 830 | 9.6E-01 | 1130 | 9.5E-01 | 2350 | 9.4E-01 | 3850 | 1.8E-01 |
| 240 | < 1.0E-05 | 540 | 9.7E-01 | 840 | 9.6E-01 | 1140 | 9.5E-01 | 2400 | 9.3E-01 | 3900 | 1.8E-01 |
| 250 | < 1.0E-05 | 550 | 9.8E-01 | 850 | 9.6E-01 | 1150 | 9.5E-01 | 2450 | 9.2E-01 | 3950 | 1.7E-01 |
| 260 | < 1.0E-05 | 560 | 9.8E-01 | 860 | 9.6E-01 | 1160 | 9.5E-01 | 2500 | 9.1E-01 | 4000 | 1.7E-01 |
| 270 | < 1.0E-05 | 570 | 9.8E-01 | 870 | 9.6E-01 | 1170 | 9.5E-01 | 2550 | 9.1E-01 | 4050 | 1.6E-01 |
| 280 | < 1.0E-05 | 580 | 9.8E-01 | 880 | 9.6E-01 | 1180 | 9.5E-01 | 2600 | 9.1E-01 | 4100 | 1.4E-01 |
| 290 | < 1.0E-05 | 590 | 9.9E-01 | 890 | 9.5E-01 | 1190 | 9.5E-01 | 2650 | 8.9E-01 | 4150 | 1.2E-01 |
| 300 | < 1.0E-05 | 600 | 9.9E-01 | 900 | 9.5E-01 | 1200 | 9.5E-01 | 2700 | 8.1E-01 | 4200 | 1.1E-01 |
| 310 | < 1.0E-05 | 610 | 9.9E-01 | 910 | 9.5E-01 | 1250 | 9.5E-01 | 2750 | 3.2E-01 | 4250 | 8.6E-02 |
| 320 | < 1.0E-05 | 620 | 9.9E-01 | 920 | 9.5E-01 | 1300 | 9.5E-01 | 2800 | 2.4E-01 | 4300 | 6.6E-02 |
| 330 | < 1.0E-05 | 630 | 9.9E-01 | 930 | 9.5E-01 | 1350 | 9.5E-01 | 2850 | 2.5E-01 | 4350 | 4.6E-02 |
| 340 | < 1.0E-05 | 640 | 9.8E-01 | 940 | 9.5E-01 | 1400 | 9.5E-01 | 2900 | 2.7E-01 | 4400 | 2.4E-02 |
| 350 | < 1.0E-05 | 650 | 9.8E-01 | 950 | 9.5E-01 | 1450 | 9.6E-01 | 2950 | 2.8E-01 | 4450 | 9.5E-03 |
| 360 | < 1.0E-05 | 660 | 9.8E-01 | 960 | 9.5E-01 | 1500 | 9.6E-01 | 3000 | 2.8E-01 | 4500 | 2.9E-03 |
| 370 | < 1.0E-05 | 670 | 9.8E-01 | 970 | 9.5E-01 | 1550 | 9.7E-01 | 3050 | 2.8E-01 | 4550 | 9.8E-04 |
| 380 | < 1.0E-05 | 680 | 9.8E-01 | 980 | 9.5E-01 | 1600 | 9.7E-01 | 3100 | 2.7E-01 | 4600 | 3.0E-04 |
| 390 | < 1.0E-05 | 690 | 9.8E-01 | 990 | 9.5E-01 | 1650 | 9.7E-01 | 3150 | 2.6E-01 | 4650 | 9.5E-05 |
| 400 | 7.0E-05 | 700 | 9.8E-01 | 1000 | 9.5E-01 | 1700 | 9.7E-01 | 3200 | 2.4E-01 | 4700 | 3.1E-05 |
| 410 | 6.1E-02 | 710 | 9.8E-01 | 1010 | 9.5E-01 | 1750 | 9.7E-01 | 3250 | 2.2E-01 | 4750 | 1.3E-05 |
| 420 | 4.8E-01 | 720 | 9.8E-01 | 1020 | 9.5E-01 | 1800 | 9.7E-01 | 3300 | 2.1E-01 | 4800 | < 1.0E-05 |
| 430 | 7.7E-01 | 730 | 9.8E-01 | 1030 | 9.5E-01 | 1850 | 9.7E-01 | 3350 | 1.9E-01 | 4850 | < 1.0E-05 |
| 440 | 8.6E-01 | 740 | 9.7E-01 | 1040 | 9.5E-01 | 1900 | 9.6E-01 | 3400 | 1.8E-01 | 4900 | < 1.0E-05 |
| 450 | 8.8E-01 | 750 | 9.7E-01 | 1050 | 9.5E-01 | 1950 | 9.6E-01 | 3450 | 1.6E-01 | 4950 | < 1.0E-05 |
| 460 | 9.0E-01 | 760 | 9.7E-01 | 1060 | 9.5E-01 | 2000 | 9.6E-01 | 3500 | 1.6E-01 | 5000 | < 1.0E-05 |
| 470 | 9.2E-01 | 770 | 9.7E-01 | 1070 | 9.5E-01 | 2050 | 9.6E-01 | 3550 | 1.6E-01 | 5050 | < 1.0E-05 |
| 480 | 9.3E-01 | 780 | 9.7E-01 | 1080 | 9.5E-01 | 2100 | 9.6E-01 | 3600 | 1.5E-01 | 5100 | < 1.0E-05 |
| 490 | 9.4E-01 | 790 | 9.7E-01 | 1090 | 9.5E-01 | 2150 | 9.5E-01 | 3650 | 1.5E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## GG435

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 435 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 370 | |
| λp (τip = 0.92) [nm] | = | 520 | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 546 | Hg | 1.52 |
| 587.6 | He | 1.52 |
| 852.1 | Cs | 1.52 |
| 1014 | Hg | 1.51 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.55 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 537 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.8 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.1 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.08 |

| Notes |
|---|
| |
| Colloidally colored glass |
| |
| Long pass filter |

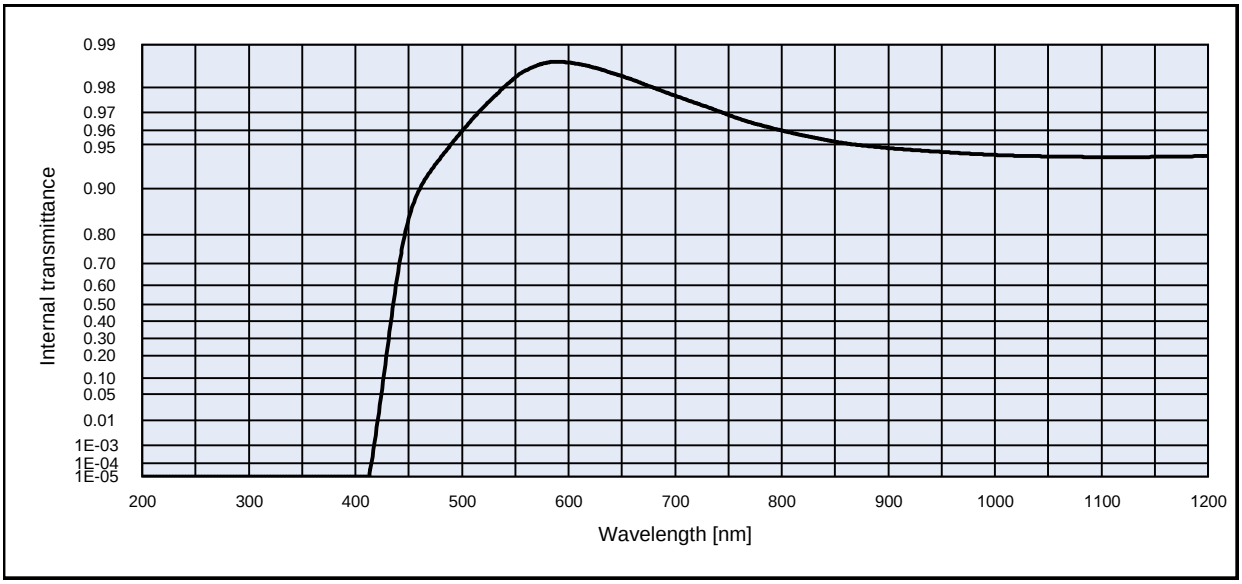
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

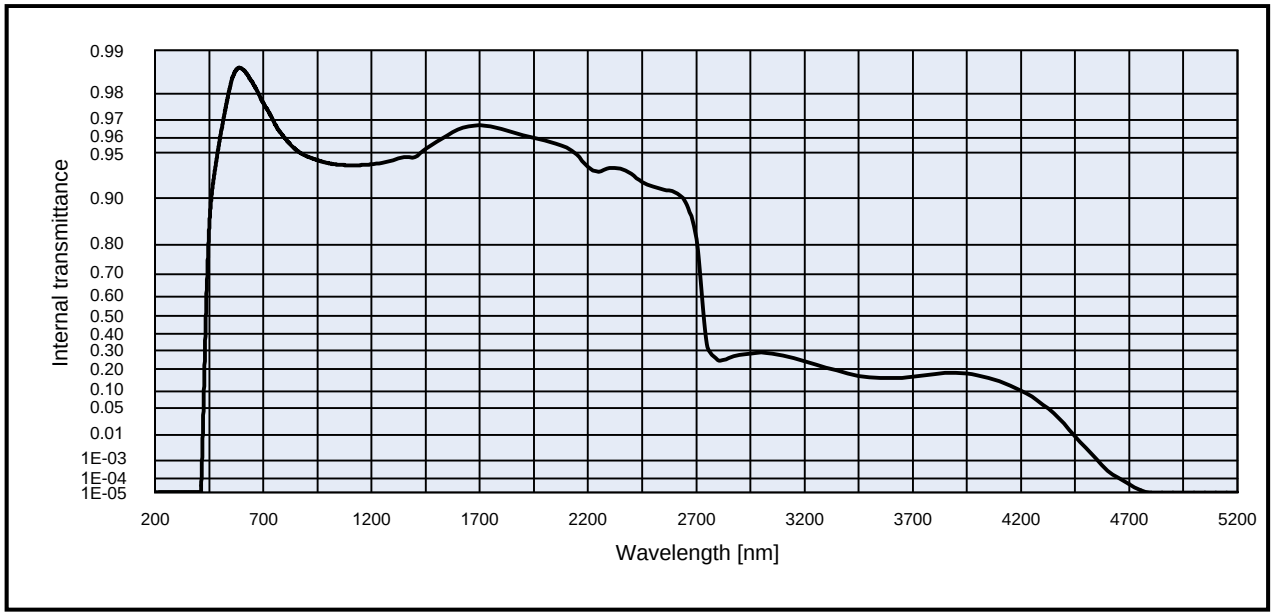
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.453 | 0.457 | 0.459 |
| y | 0.415 | 0.419 | 0.422 |
| Y | 91 | 91 | 90 |
| $\lambda_d$ [nm] | 580 | 580 | 580 |
| $P_e$ | 0.09 | 0.14 | 0.18 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.430 | 0.434 | 0.437 |
| y | 0.409 | 0.414 | 0.418 |
| Y | 91 | 90 | 90 |
| $\lambda_d$ [nm] | 578 | 578 | 578 |
| $P_e$ | 0.10 | 0.15 | 0.19 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.323 | 0.328 | 0.333 |
| y | 0.350 | 0.361 | 0.369 |
| Y | 91 | 90 | 90 |
| $\lambda_d$ [nm] | 568 | 568 | 568 |
| $P_e$ | 0.09 | 0.13 | 0.17 |



# GG435




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.6E-01 | 800 | 9.6E-01 | 1100 | 9.4E-01 | 2200 | 9.4E-01 | 3700 | 1.6E-01 |
| 210 | < 1.0E-05 | 510 | 9.7E-01 | 810 | 9.6E-01 | 1110 | 9.4E-01 | 2250 | 9.3E-01 | 3750 | 1.7E-01 |
| 220 | < 1.0E-05 | 520 | 9.7E-01 | 820 | 9.6E-01 | 1120 | 9.4E-01 | 2300 | 9.4E-01 | 3800 | 1.8E-01 |
| 230 | < 1.0E-05 | 530 | 9.8E-01 | 830 | 9.6E-01 | 1130 | 9.4E-01 | 2350 | 9.4E-01 | 3850 | 1.8E-01 |
| 240 | < 1.0E-05 | 540 | 9.8E-01 | 840 | 9.5E-01 | 1140 | 9.4E-01 | 2400 | 9.3E-01 | 3900 | 1.8E-01 |
| 250 | < 1.0E-05 | 550 | 9.8E-01 | 850 | 9.5E-01 | 1150 | 9.4E-01 | 2450 | 9.2E-01 | 3950 | 1.8E-01 |
| 260 | < 1.0E-05 | 560 | 9.8E-01 | 860 | 9.5E-01 | 1160 | 9.4E-01 | 2500 | 9.2E-01 | 4000 | 1.7E-01 |
| 270 | < 1.0E-05 | 570 | 9.9E-01 | 870 | 9.5E-01 | 1170 | 9.4E-01 | 2550 | 9.1E-01 | 4050 | 1.6E-01 |
| 280 | < 1.0E-05 | 580 | 9.9E-01 | 880 | 9.5E-01 | 1180 | 9.4E-01 | 2600 | 9.1E-01 | 4100 | 1.4E-01 |
| 290 | < 1.0E-05 | 590 | 9.9E-01 | 890 | 9.5E-01 | 1190 | 9.4E-01 | 2650 | 8.9E-01 | 4150 | 1.2E-01 |
| 300 | < 1.0E-05 | 600 | 9.9E-01 | 900 | 9.5E-01 | 1200 | 9.4E-01 | 2700 | 8.2E-01 | 4200 | 1.0E-01 |
| 310 | < 1.0E-05 | 610 | 9.9E-01 | 910 | 9.5E-01 | 1250 | 9.4E-01 | 2750 | 3.4E-01 | 4250 | 8.2E-02 |
| 320 | < 1.0E-05 | 620 | 9.9E-01 | 920 | 9.5E-01 | 1300 | 9.4E-01 | 2800 | 2.5E-01 | 4300 | 5.9E-02 |
| 330 | < 1.0E-05 | 630 | 9.9E-01 | 930 | 9.5E-01 | 1350 | 9.5E-01 | 2850 | 2.6E-01 | 4350 | 3.9E-02 |
| 340 | < 1.0E-05 | 640 | 9.8E-01 | 940 | 9.4E-01 | 1400 | 9.5E-01 | 2900 | 2.7E-01 | 4400 | 2.1E-02 |
| 350 | < 1.0E-05 | 650 | 9.8E-01 | 950 | 9.4E-01 | 1450 | 9.5E-01 | 2950 | 2.8E-01 | 4450 | 9.2E-03 |
| 360 | < 1.0E-05 | 660 | 9.8E-01 | 960 | 9.4E-01 | 1500 | 9.6E-01 | 3000 | 2.9E-01 | 4500 | 3.5E-03 |
| 370 | < 1.0E-05 | 670 | 9.8E-01 | 970 | 9.4E-01 | 1550 | 9.6E-01 | 3050 | 2.8E-01 | 4550 | 1.1E-03 |
| 380 | < 1.0E-05 | 680 | 9.8E-01 | 980 | 9.4E-01 | 1600 | 9.7E-01 | 3100 | 2.7E-01 | 4600 | 3.0E-04 |
| 390 | < 1.0E-05 | 690 | 9.8E-01 | 990 | 9.4E-01 | 1650 | 9.7E-01 | 3150 | 2.6E-01 | 4650 | 1.1E-04 |
| 400 | < 1.0E-05 | 700 | 9.8E-01 | 1000 | 9.4E-01 | 1700 | 9.7E-01 | 3200 | 2.4E-01 | 4700 | 4.2E-05 |
| 410 | < 1.0E-05 | 710 | 9.8E-01 | 1010 | 9.4E-01 | 1750 | 9.7E-01 | 3250 | 2.2E-01 | 4750 | 1.6E-05 |
| 420 | 5.7E-03 | 720 | 9.7E-01 | 1020 | 9.4E-01 | 1800 | 9.7E-01 | 3300 | 2.1E-01 | 4800 | < 1.0E-05 |
| 430 | 2.4E-01 | 730 | 9.7E-01 | 1030 | 9.4E-01 | 1850 | 9.6E-01 | 3350 | 1.9E-01 | 4850 | < 1.0E-05 |
| 440 | 6.6E-01 | 740 | 9.7E-01 | 1040 | 9.4E-01 | 1900 | 9.6E-01 | 3400 | 1.8E-01 | 4900 | < 1.0E-05 |
| 450 | 8.4E-01 | 750 | 9.7E-01 | 1050 | 9.4E-01 | 1950 | 9.6E-01 | 3450 | 1.7E-01 | 4950 | < 1.0E-05 |
| 460 | 9.0E-01 | 760 | 9.7E-01 | 1060 | 9.4E-01 | 2000 | 9.6E-01 | 3500 | 1.6E-01 | 5000 | < 1.0E-05 |
| 470 | 9.2E-01 | 770 | 9.7E-01 | 1070 | 9.4E-01 | 2050 | 9.6E-01 | 3550 | 1.6E-01 | 5050 | < 1.0E-05 |
| 480 | 9.4E-01 | 780 | 9.6E-01 | 1080 | 9.4E-01 | 2100 | 9.5E-01 | 3600 | 1.6E-01 | 5100 | < 1.0E-05 |
| 490 | 9.5E-01 | 790 | 9.6E-01 | 1090 | 9.4E-01 | 2150 | 9.5E-01 | 3650 | 1.6E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## GG455

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 455 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 390 | |
| λp (τip = 0.92) [nm] | = | 530 | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 546 | Hg | 1.53 |
| 587.6 | He | 1.52 |
| 852.1 | Cs | 1.52 |
| 1014 | Hg | 1.51 |

| Density | |
|---|---|
| ρ [g/cm³] | 2.56 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 529 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 8.2 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.5 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.09 |

| Notes |
|---|
| |
| Colloidally colored glass |
| |
| Long pass filter |

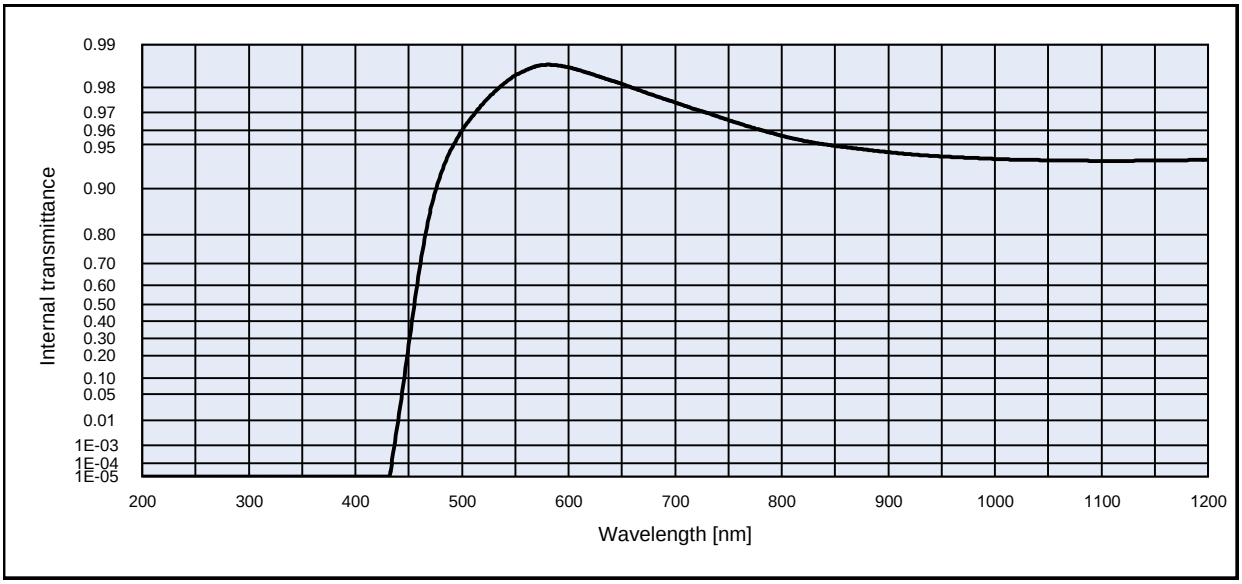
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

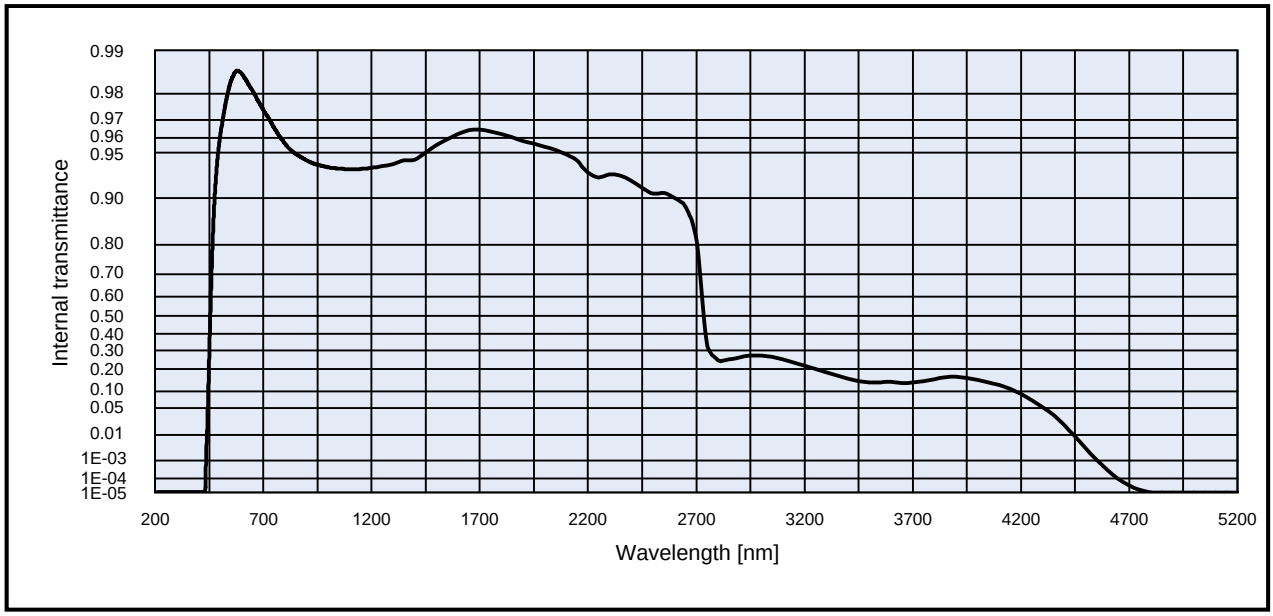
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.465 | 0.470 | 0.473 |
| y | 0.431 | 0.437 | 0.441 |
| Y | 91 | 90 | 90 |
| $\lambda_d$ [nm] | 579 | 580 | 580 |
| $P_e$ | 0.28 | 0.36 | 0.41 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.444 | 0.451 | 0.455 |
| y | 0.429 | 0.438 | 0.443 |
| Y | 91 | 90 | 90 |
| $\lambda_d$ [nm] | 577 | 578 | 578 |
| $P_e$ | 0.29 | 0.37 | 0.42 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.344 | 0.354 | 0.361 |
| y | 0.394 | 0.414 | 0.426 |
| Y | 91 | 90 | 89 |
| $\lambda_d$ [nm] | 568 | 568 | 568 |
| $P_e$ | 0.27 | 0.36 | 0.41 |



# GG455




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.6E-01 | 800 | 9.6E-01 | 1100 | 9.4E-01 | 2200 | 9.3E-01 | 3700 | 1.4E-01 |
| 210 | < 1.0E-05 | 510 | 9.7E-01 | 810 | 9.5E-01 | 1110 | 9.4E-01 | 2250 | 9.3E-01 | 3750 | 1.4E-01 |
| 220 | < 1.0E-05 | 520 | 9.7E-01 | 820 | 9.5E-01 | 1120 | 9.4E-01 | 2300 | 9.3E-01 | 3800 | 1.5E-01 |
| 230 | < 1.0E-05 | 530 | 9.8E-01 | 830 | 9.5E-01 | 1130 | 9.4E-01 | 2350 | 9.3E-01 | 3850 | 1.6E-01 |
| 240 | < 1.0E-05 | 540 | 9.8E-01 | 840 | 9.5E-01 | 1140 | 9.4E-01 | 2400 | 9.2E-01 | 3900 | 1.6E-01 |
| 250 | < 1.0E-05 | 550 | 9.8E-01 | 850 | 9.5E-01 | 1150 | 9.4E-01 | 2450 | 9.1E-01 | 3950 | 1.6E-01 |
| 260 | < 1.0E-05 | 560 | 9.8E-01 | 860 | 9.5E-01 | 1160 | 9.4E-01 | 2500 | 9.1E-01 | 4000 | 1.5E-01 |
| 270 | < 1.0E-05 | 570 | 9.9E-01 | 870 | 9.5E-01 | 1170 | 9.4E-01 | 2550 | 9.1E-01 | 4050 | 1.4E-01 |
| 280 | < 1.0E-05 | 580 | 9.9E-01 | 880 | 9.5E-01 | 1180 | 9.4E-01 | 2600 | 9.0E-01 | 4100 | 1.2E-01 |
| 290 | < 1.0E-05 | 590 | 9.9E-01 | 890 | 9.4E-01 | 1190 | 9.4E-01 | 2650 | 8.9E-01 | 4150 | 1.1E-01 |
| 300 | < 1.0E-05 | 600 | 9.9E-01 | 900 | 9.4E-01 | 1200 | 9.4E-01 | 2700 | 8.1E-01 | 4200 | 9.1E-02 |
| 310 | < 1.0E-05 | 610 | 9.8E-01 | 910 | 9.4E-01 | 1250 | 9.4E-01 | 2750 | 3.5E-01 | 4250 | 7.1E-02 |
| 320 | < 1.0E-05 | 620 | 9.8E-01 | 920 | 9.4E-01 | 1300 | 9.4E-01 | 2800 | 2.5E-01 | 4300 | 5.1E-02 |
| 330 | < 1.0E-05 | 630 | 9.8E-01 | 930 | 9.4E-01 | 1350 | 9.4E-01 | 2850 | 2.5E-01 | 4350 | 3.5E-02 |
| 340 | < 1.0E-05 | 640 | 9.8E-01 | 940 | 9.4E-01 | 1400 | 9.4E-01 | 2900 | 2.6E-01 | 4400 | 2.0E-02 |
| 350 | < 1.0E-05 | 650 | 9.8E-01 | 950 | 9.4E-01 | 1450 | 9.5E-01 | 2950 | 2.7E-01 | 4450 | 9.1E-03 |
| 360 | < 1.0E-05 | 660 | 9.8E-01 | 960 | 9.4E-01 | 1500 | 9.6E-01 | 3000 | 2.7E-01 | 4500 | 3.4E-03 |
| 370 | < 1.0E-05 | 670 | 9.8E-01 | 970 | 9.4E-01 | 1550 | 9.6E-01 | 3050 | 2.6E-01 | 4550 | 1.1E-03 |
| 380 | < 1.0E-05 | 680 | 9.8E-01 | 980 | 9.4E-01 | 1600 | 9.6E-01 | 3100 | 2.5E-01 | 4600 | 3.1E-04 |
| 390 | < 1.0E-05 | 690 | 9.8E-01 | 990 | 9.4E-01 | 1650 | 9.6E-01 | 3150 | 2.3E-01 | 4650 | 9.5E-05 |
| 400 | < 1.0E-05 | 700 | 9.7E-01 | 1000 | 9.4E-01 | 1700 | 9.7E-01 | 3200 | 2.2E-01 | 4700 | 3.2E-05 |
| 410 | < 1.0E-05 | 710 | 9.7E-01 | 1010 | 9.4E-01 | 1750 | 9.6E-01 | 3250 | 2.0E-01 | 4750 | 1.5E-05 |
| 420 | < 1.0E-05 | 720 | 9.7E-01 | 1020 | 9.4E-01 | 1800 | 9.6E-01 | 3300 | 1.8E-01 | 4800 | < 1.0E-05 |
| 430 | < 1.0E-05 | 730 | 9.7E-01 | 1030 | 9.4E-01 | 1850 | 9.6E-01 | 3350 | 1.7E-01 | 4850 | < 1.0E-05 |
| 440 | 9.6E-03 | 740 | 9.7E-01 | 1040 | 9.4E-01 | 1900 | 9.6E-01 | 3400 | 1.5E-01 | 4900 | < 1.0E-05 |
| 450 | 2.6E-01 | 750 | 9.7E-01 | 1050 | 9.4E-01 | 1950 | 9.6E-01 | 3450 | 1.4E-01 | 4950 | < 1.0E-05 |
| 460 | 6.7E-01 | 760 | 9.6E-01 | 1060 | 9.4E-01 | 2000 | 9.5E-01 | 3500 | 1.4E-01 | 5000 | < 1.0E-05 |
| 470 | 8.6E-01 | 770 | 9.6E-01 | 1070 | 9.4E-01 | 2050 | 9.5E-01 | 3550 | 1.4E-01 | 5050 | < 1.0E-05 |
| 480 | 9.2E-01 | 780 | 9.6E-01 | 1080 | 9.4E-01 | 2100 | 9.5E-01 | 3600 | 1.4E-01 | 5100 | < 1.0E-05 |
| 490 | 9.5E-01 | 790 | 9.6E-01 | 1090 | 9.4E-01 | 2150 | 9.4E-01 | 3650 | 1.3E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## GG475

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 475 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 410 | |
| λp (τip = 0.92) [nm] | = | 550 | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 546 | Hg | 1.53 |
| 587.6 | He | 1.52 |
| 852.1 | Cs | 1.52 |
| 1014 | Hg | 1.51 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.56 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 531 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 8.2 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.4 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.09 |

| Notes |
|---|
| |
| Colloidally colored glass |
| |
| Long pass filter |

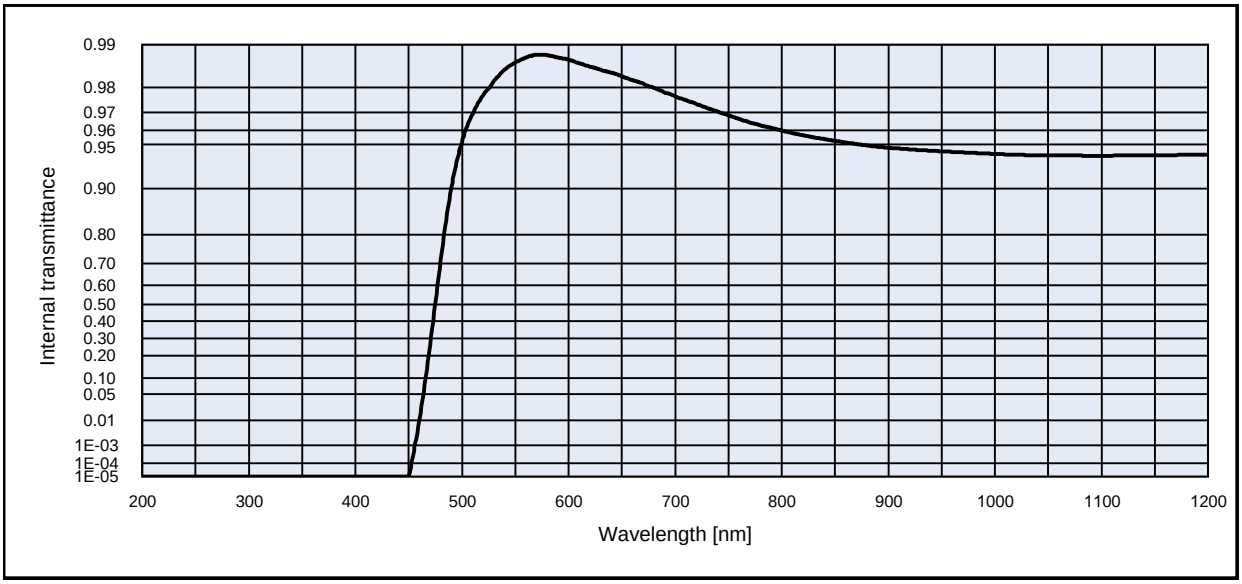
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.483 | 0.489 | 0.492 |
| y | 0.453 | 0.460 | 0.463 |
| Y | 91 | 90 | 89 |
| $\lambda_d$ [nm] | 580 | 580 | 580 |
| $P_e$ | 0.56 | 0.65 | 0.69 |

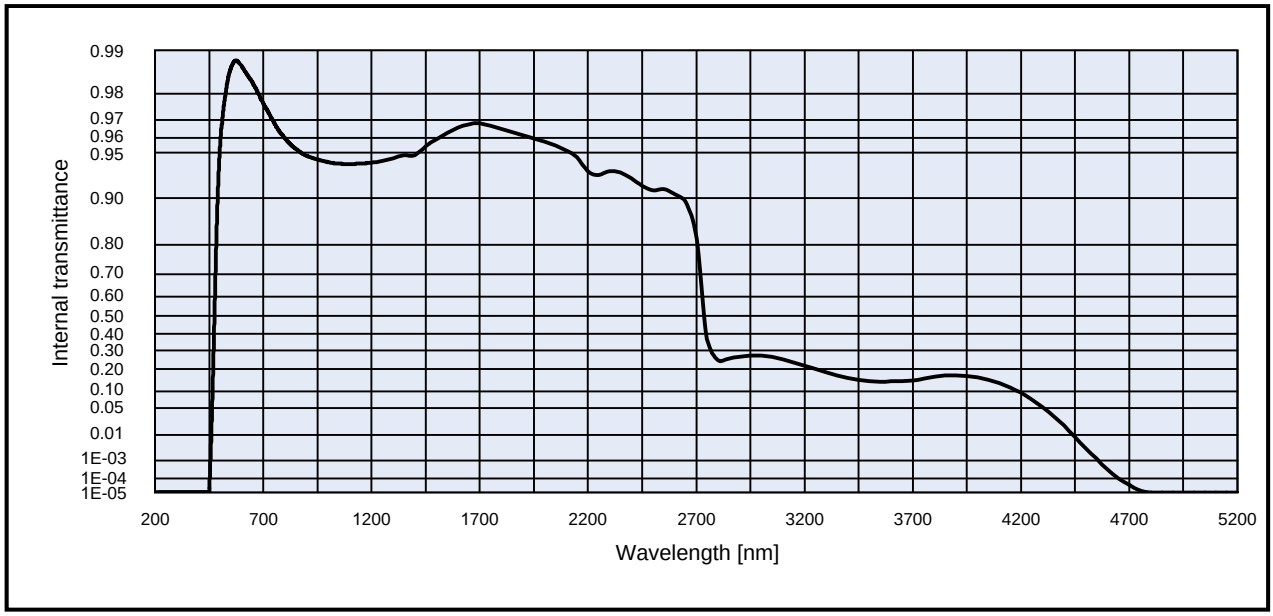
| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.465 | 0.473 | 0.476 |
| y | 0.458 | 0.466 | 0.470 |
| Y | 91 | 90 | 89 |
| $\lambda_d$ [nm] | 578 | 578 | 578 |
| $P_e$ | 0.57 | 0.66 | 0.70 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.381 | 0.394 | 0.401 |
| y | 0.463 | 0.485 | 0.494 |
| Y | 89 | 88 | 88 |
| $\lambda_d$ [nm] | 568 | 569 | 569 |
| $P_e$ | 0.57 | 0.66 | 0.71 |



# GG475

SCHOTT




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.5E-01 | 800 | 9.6E-01 | 1100 | 9.4E-01 | 2200 | 9.3E-01 | 3700 | 1.5E-01 |
| 210 | < 1.0E-05 | 510 | 9.7E-01 | 810 | 9.6E-01 | 1110 | 9.4E-01 | 2250 | 9.3E-01 | 3750 | 1.5E-01 |
| 220 | < 1.0E-05 | 520 | 9.8E-01 | 820 | 9.6E-01 | 1120 | 9.4E-01 | 2300 | 9.3E-01 | 3800 | 1.6E-01 |
| 230 | < 1.0E-05 | 530 | 9.8E-01 | 830 | 9.6E-01 | 1130 | 9.4E-01 | 2350 | 9.3E-01 | 3850 | 1.7E-01 |
| 240 | < 1.0E-05 | 540 | 9.9E-01 | 840 | 9.5E-01 | 1140 | 9.4E-01 | 2400 | 9.3E-01 | 3900 | 1.7E-01 |
| 250 | < 1.0E-05 | 550 | 9.9E-01 | 850 | 9.5E-01 | 1150 | 9.4E-01 | 2450 | 9.2E-01 | 3950 | 1.7E-01 |
| 260 | < 1.0E-05 | 560 | 9.9E-01 | 860 | 9.5E-01 | 1160 | 9.4E-01 | 2500 | 9.1E-01 | 4000 | 1.6E-01 |
| 270 | < 1.0E-05 | 570 | 9.9E-01 | 870 | 9.5E-01 | 1170 | 9.4E-01 | 2550 | 9.1E-01 | 4050 | 1.5E-01 |
| 280 | < 1.0E-05 | 580 | 9.9E-01 | 880 | 9.5E-01 | 1180 | 9.4E-01 | 2600 | 9.1E-01 | 4100 | 1.3E-01 |
| 290 | < 1.0E-05 | 590 | 9.9E-01 | 890 | 9.5E-01 | 1190 | 9.4E-01 | 2650 | 8.9E-01 | 4150 | 1.1E-01 |
| 300 | < 1.0E-05 | 600 | 9.9E-01 | 900 | 9.5E-01 | 1200 | 9.4E-01 | 2700 | 8.2E-01 | 4200 | 9.5E-02 |
| 310 | < 1.0E-05 | 610 | 9.9E-01 | 910 | 9.5E-01 | 1250 | 9.4E-01 | 2750 | 3.7E-01 | 4250 | 7.1E-02 |
| 320 | < 1.0E-05 | 620 | 9.9E-01 | 920 | 9.5E-01 | 1300 | 9.5E-01 | 2800 | 2.5E-01 | 4300 | 5.1E-02 |
| 330 | < 1.0E-05 | 630 | 9.8E-01 | 930 | 9.5E-01 | 1350 | 9.5E-01 | 2850 | 2.6E-01 | 4350 | 3.3E-02 |
| 340 | < 1.0E-05 | 640 | 9.8E-01 | 940 | 9.4E-01 | 1400 | 9.5E-01 | 2900 | 2.7E-01 | 4400 | 1.9E-02 |
| 350 | < 1.0E-05 | 650 | 9.8E-01 | 950 | 9.4E-01 | 1450 | 9.5E-01 | 2950 | 2.7E-01 | 4450 | 8.8E-03 |
| 360 | < 1.0E-05 | 660 | 9.8E-01 | 960 | 9.4E-01 | 1500 | 9.6E-01 | 3000 | 2.7E-01 | 4500 | 3.3E-03 |
| 370 | < 1.0E-05 | 670 | 9.8E-01 | 970 | 9.4E-01 | 1550 | 9.6E-01 | 3050 | 2.7E-01 | 4550 | 1.2E-03 |
| 380 | < 1.0E-05 | 680 | 9.8E-01 | 980 | 9.4E-01 | 1600 | 9.7E-01 | 3100 | 2.5E-01 | 4600 | 3.4E-04 |
| 390 | < 1.0E-05 | 690 | 9.8E-01 | 990 | 9.4E-01 | 1650 | 9.7E-01 | 3150 | 2.3E-01 | 4650 | 1.0E-04 |
| 400 | < 1.0E-05 | 700 | 9.8E-01 | 1000 | 9.4E-01 | 1700 | 9.7E-01 | 3200 | 2.2E-01 | 4700 | 3.7E-05 |
| 410 | < 1.0E-05 | 710 | 9.8E-01 | 1010 | 9.4E-01 | 1750 | 9.7E-01 | 3250 | 2.0E-01 | 4750 | 1.4E-05 |
| 420 | < 1.0E-05 | 720 | 9.7E-01 | 1020 | 9.4E-01 | 1800 | 9.7E-01 | 3300 | 1.8E-01 | 4800 | < 1.0E-05 |
| 430 | < 1.0E-05 | 730 | 9.7E-01 | 1030 | 9.4E-01 | 1850 | 9.6E-01 | 3350 | 1.7E-01 | 4850 | < 1.0E-05 |
| 440 | < 1.0E-05 | 740 | 9.7E-01 | 1040 | 9.4E-01 | 1900 | 9.6E-01 | 3400 | 1.6E-01 | 4900 | < 1.0E-05 |
| 450 | < 1.0E-05 | 750 | 9.7E-01 | 1050 | 9.4E-01 | 1950 | 9.6E-01 | 3450 | 1.5E-01 | 4950 | < 1.0E-05 |
| 460 | 1.0E-02 | 760 | 9.7E-01 | 1060 | 9.4E-01 | 2000 | 9.6E-01 | 3500 | 1.4E-01 | 5000 | < 1.0E-05 |
| 470 | 2.6E-01 | 770 | 9.6E-01 | 1070 | 9.4E-01 | 2050 | 9.6E-01 | 3550 | 1.4E-01 | 5050 | < 1.0E-05 |
| 480 | 7.1E-01 | 780 | 9.6E-01 | 1080 | 9.4E-01 | 2100 | 9.5E-01 | 3600 | 1.4E-01 | 5100 | < 1.0E-05 |
| 490 | 9.0E-01 | 790 | 9.6E-01 | 1090 | 9.4E-01 | 2150 | 9.5E-01 | 3650 | 1.4E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## GG495

| Density | |
|---|---|
| ρ [g/cm³] | 2.56 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 495 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 430 | |
| λp (τip = 0.92) [nm] | = | 560 | |

| Transformation temperature | |
|---|---|
| Tg [°C] | 535 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 8.1 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.4 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 546 | Hg | 1.53 |
| 587.6 | He | 1.52 |
| 852.1 | Cs | 1.52 |
| 1014 | Hg | 1.51 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.10 |

| Notes |
|---|
| |
| Colloidally colored glass |
| |
| Long pass filter |

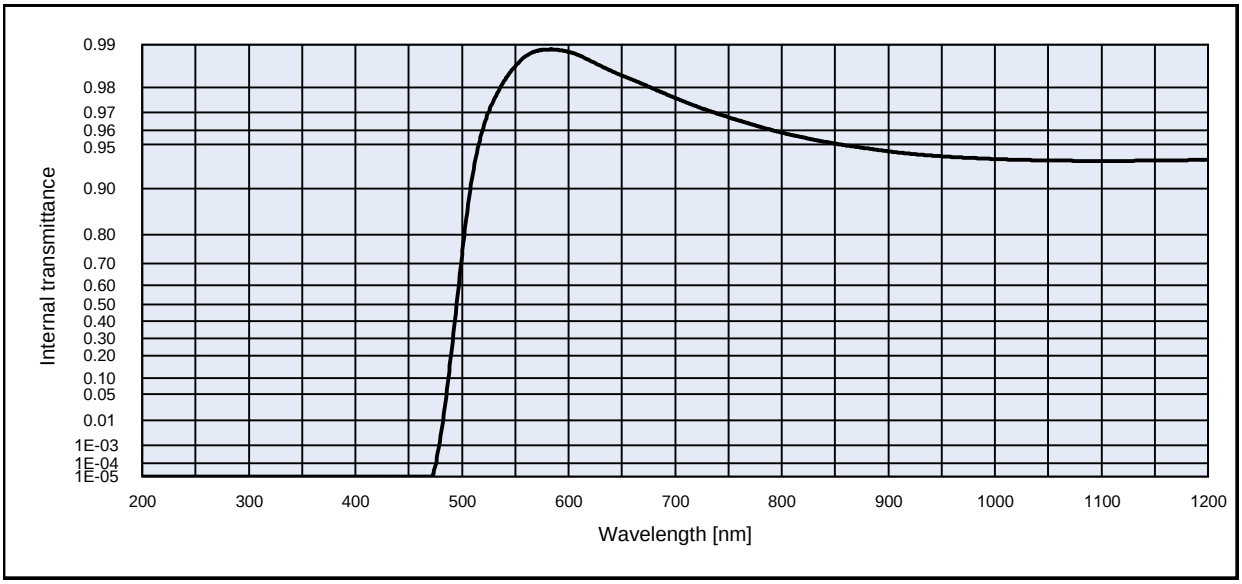
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

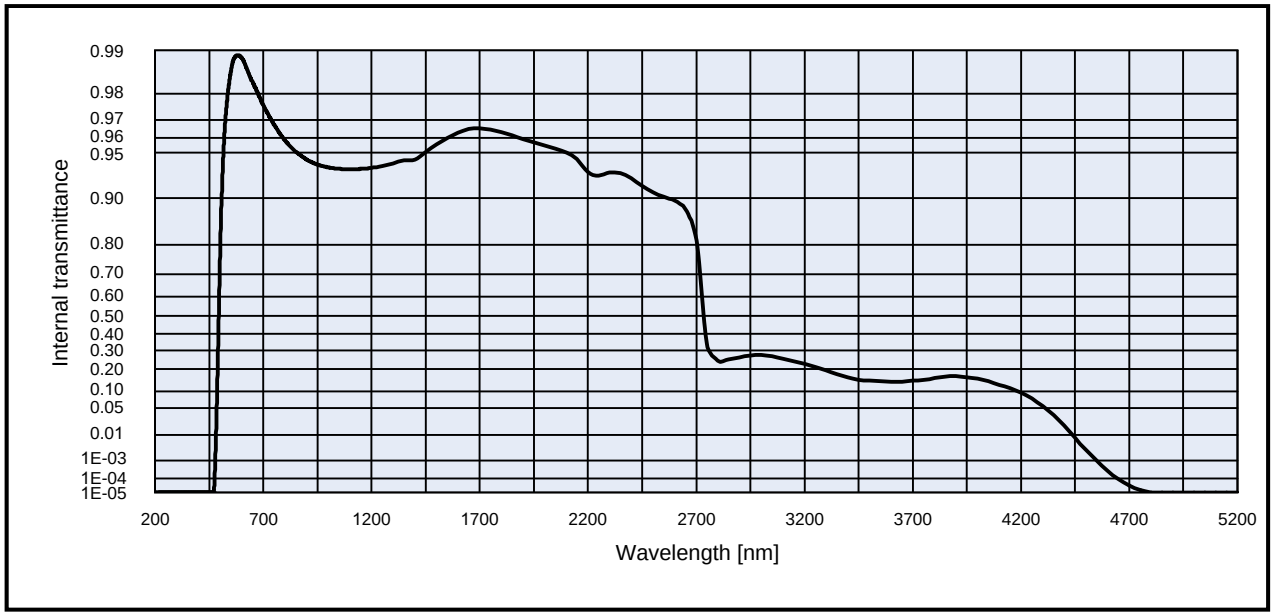
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.502 | 0.507 | 0.509 |
| y | 0.469 | 0.472 | 0.472 |
| Y | 89 | 88 | 88 |
| $\lambda_d$ [nm] | 580 | 581 | 581 |
| $P_e$ | 0.81 | 0.86 | 0.88 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.488 | 0.494 | 0.497 |
| y | 0.478 | 0.482 | 0.482 |
| Y | 89 | 88 | 87 |
| $\lambda_d$ [nm] | 579 | 579 | 579 |
| $P_e$ | 0.82 | 0.87 | 0.89 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.422 | 0.433 | 0.438 |
| y | 0.514 | 0.525 | 0.527 |
| Y | 87 | 85 | 84 |
| $\lambda_d$ [nm] | 570 | 571 | 571 |
| $P_e$ | 0.82 | 0.89 | 0.90 |



# GG495




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 7.3E-01 | 800 | 9.6E-01 | 1100 | 9.4E-01 | 2200 | 9.3E-01 | 3700 | 1.4E-01 |
| 210 | < 1.0E-05 | 510 | 9.2E-01 | 810 | 9.6E-01 | 1110 | 9.4E-01 | 2250 | 9.3E-01 | 3750 | 1.5E-01 |
| 220 | < 1.0E-05 | 520 | 9.6E-01 | 820 | 9.6E-01 | 1120 | 9.4E-01 | 2300 | 9.3E-01 | 3800 | 1.6E-01 |
| 230 | < 1.0E-05 | 530 | 9.8E-01 | 830 | 9.5E-01 | 1130 | 9.4E-01 | 2350 | 9.3E-01 | 3850 | 1.6E-01 |
| 240 | < 1.0E-05 | 540 | 9.8E-01 | 840 | 9.5E-01 | 1140 | 9.4E-01 | 2400 | 9.3E-01 | 3900 | 1.6E-01 |
| 250 | < 1.0E-05 | 550 | 9.9E-01 | 850 | 9.5E-01 | 1150 | 9.4E-01 | 2450 | 9.2E-01 | 3950 | 1.6E-01 |
| 260 | < 1.0E-05 | 560 | 9.9E-01 | 860 | 9.5E-01 | 1160 | 9.4E-01 | 2500 | 9.1E-01 | 4000 | 1.5E-01 |
| 270 | < 1.0E-05 | 570 | 9.9E-01 | 870 | 9.5E-01 | 1170 | 9.4E-01 | 2550 | 9.0E-01 | 4050 | 1.4E-01 |
| 280 | < 1.0E-05 | 580 | 9.9E-01 | 880 | 9.5E-01 | 1180 | 9.4E-01 | 2600 | 9.0E-01 | 4100 | 1.3E-01 |
| 290 | < 1.0E-05 | 590 | 9.9E-01 | 890 | 9.5E-01 | 1190 | 9.4E-01 | 2650 | 8.8E-01 | 4150 | 1.1E-01 |
| 300 | < 1.0E-05 | 600 | 9.9E-01 | 900 | 9.4E-01 | 1200 | 9.4E-01 | 2700 | 8.1E-01 | 4200 | 9.5E-02 |
| 310 | < 1.0E-05 | 610 | 9.9E-01 | 910 | 9.4E-01 | 1250 | 9.4E-01 | 2750 | 3.4E-01 | 4250 | 7.6E-02 |
| 320 | < 1.0E-05 | 620 | 9.9E-01 | 920 | 9.4E-01 | 1300 | 9.4E-01 | 2800 | 2.4E-01 | 4300 | 5.5E-02 |
| 330 | < 1.0E-05 | 630 | 9.9E-01 | 930 | 9.4E-01 | 1350 | 9.4E-01 | 2850 | 2.5E-01 | 4350 | 3.5E-02 |
| 340 | < 1.0E-05 | 640 | 9.8E-01 | 940 | 9.4E-01 | 1400 | 9.4E-01 | 2900 | 2.6E-01 | 4400 | 1.9E-02 |
| 350 | < 1.0E-05 | 650 | 9.8E-01 | 950 | 9.4E-01 | 1450 | 9.5E-01 | 2950 | 2.7E-01 | 4450 | 8.2E-03 |
| 360 | < 1.0E-05 | 660 | 9.8E-01 | 960 | 9.4E-01 | 1500 | 9.6E-01 | 3000 | 2.8E-01 | 4500 | 2.9E-03 |
| 370 | < 1.0E-05 | 670 | 9.8E-01 | 970 | 9.4E-01 | 1550 | 9.6E-01 | 3050 | 2.7E-01 | 4550 | 1.0E-03 |
| 380 | < 1.0E-05 | 680 | 9.8E-01 | 980 | 9.4E-01 | 1600 | 9.6E-01 | 3100 | 2.6E-01 | 4600 | 3.0E-04 |
| 390 | < 1.0E-05 | 690 | 9.8E-01 | 990 | 9.4E-01 | 1650 | 9.7E-01 | 3150 | 2.4E-01 | 4650 | 9.6E-05 |
| 400 | < 1.0E-05 | 700 | 9.8E-01 | 1000 | 9.4E-01 | 1700 | 9.7E-01 | 3200 | 2.3E-01 | 4700 | 3.4E-05 |
| 410 | < 1.0E-05 | 710 | 9.7E-01 | 1010 | 9.4E-01 | 1750 | 9.6E-01 | 3250 | 2.1E-01 | 4750 | 1.5E-05 |
| 420 | < 1.0E-05 | 720 | 9.7E-01 | 1020 | 9.4E-01 | 1800 | 9.6E-01 | 3300 | 1.9E-01 | 4800 | < 1.0E-05 |
| 430 | < 1.0E-05 | 730 | 9.7E-01 | 1030 | 9.4E-01 | 1850 | 9.6E-01 | 3350 | 1.8E-01 | 4850 | < 1.0E-05 |
| 440 | < 1.0E-05 | 740 | 9.7E-01 | 1040 | 9.4E-01 | 1900 | 9.6E-01 | 3400 | 1.6E-01 | 4900 | < 1.0E-05 |
| 450 | < 1.0E-05 | 750 | 9.7E-01 | 1050 | 9.4E-01 | 1950 | 9.6E-01 | 3450 | 1.5E-01 | 4950 | < 1.0E-05 |
| 460 | < 1.0E-05 | 760 | 9.7E-01 | 1060 | 9.4E-01 | 2000 | 9.6E-01 | 3500 | 1.4E-01 | 5000 | < 1.0E-05 |
| 470 | < 1.0E-05 | 770 | 9.6E-01 | 1070 | 9.4E-01 | 2050 | 9.5E-01 | 3550 | 1.4E-01 | 5050 | < 1.0E-05 |
| 480 | 2.8E-03 | 780 | 9.6E-01 | 1080 | 9.4E-01 | 2100 | 9.5E-01 | 3600 | 1.4E-01 | 5100 | < 1.0E-05 |
| 490 | 2.2E-01 | 790 | 9.6E-01 | 1090 | 9.4E-01 | 2150 | 9.4E-01 | 3650 | 1.4E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## N-WG280

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 2 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 280 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 230 | |
| λp (τip = 0.99) [nm] | = | 380 | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 296.7 | Hg | 1.55 |
| 587.6 | He | 1.52 |
| 1014 | Hg | 1.51 |

| Density | |
|---|---|
| ρ [g/cm³] | 2.51 |

| Bubble content | |
|---|---|
| Bubble class | 1 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 2.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 558 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.1 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 8.4 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.06 |

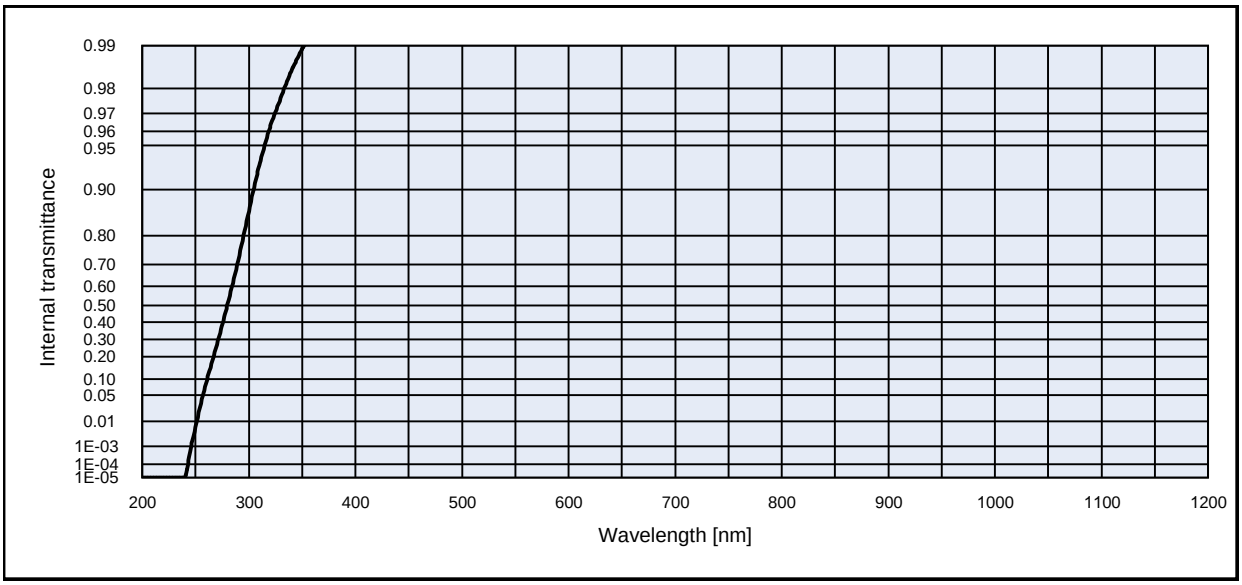
| Notes |
|---|
| |
| Base glass |
| |
| Long pass filter |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

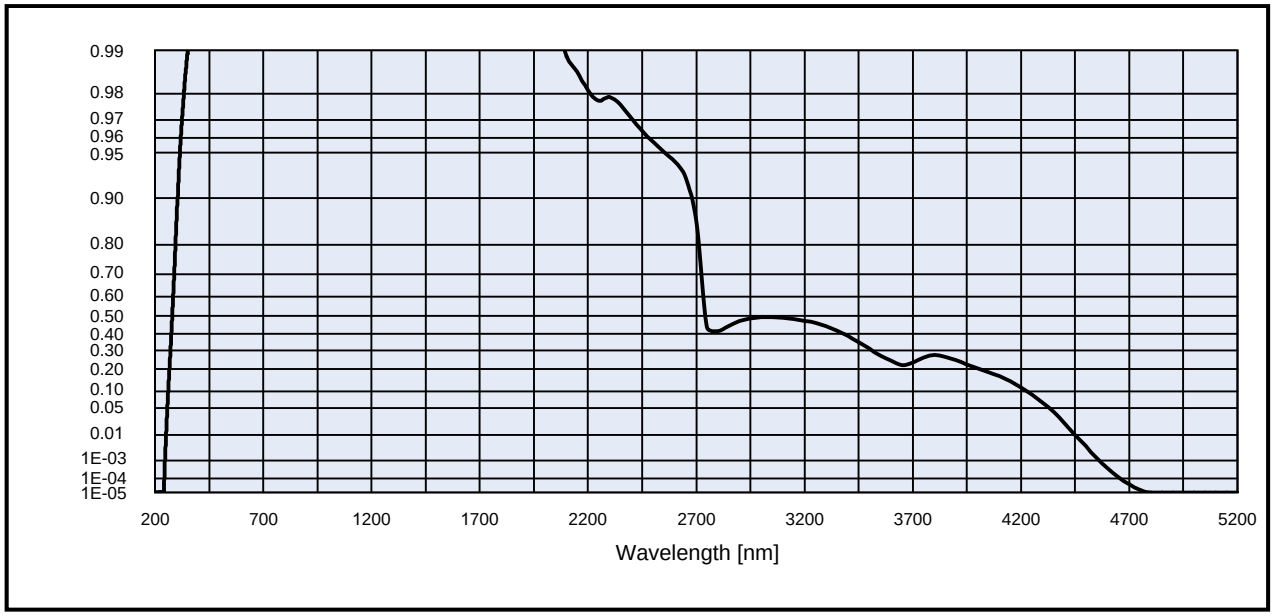
| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# N-WG280

SCHOTT




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 2**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 1.0E+00 | 800 | 1.0E+00 | 1100 | 1.0E+00 | 2200 | 9.8E-01 | 3700 | 2.3E-01 |
| 210 | < 1.0E-05 | 510 | 1.0E+00 | 810 | 1.0E+00 | 1110 | 1.0E+00 | 2250 | 9.8E-01 | 3750 | 2.6E-01 |
| 220 | < 1.0E-05 | 520 | 1.0E+00 | 820 | 1.0E+00 | 1120 | 1.0E+00 | 2300 | 9.8E-01 | 3800 | 2.7E-01 |
| 230 | < 1.0E-05 | 530 | 1.0E+00 | 830 | 1.0E+00 | 1130 | 1.0E+00 | 2350 | 9.8E-01 | 3850 | 2.7E-01 |
| 240 | < 1.0E-05 | 540 | 1.0E+00 | 840 | 1.0E+00 | 1140 | 1.0E+00 | 2400 | 9.7E-01 | 3900 | 2.5E-01 |
| 250 | 6.6E-03 | 550 | 1.0E+00 | 850 | 1.0E+00 | 1150 | 1.0E+00 | 2450 | 9.6E-01 | 3950 | 2.2E-01 |
| 260 | 8.6E-02 | 560 | 1.0E+00 | 860 | 1.0E+00 | 1160 | 1.0E+00 | 2500 | 9.6E-01 | 4000 | 2.0E-01 |
| 270 | 2.7E-01 | 570 | 1.0E+00 | 870 | 1.0E+00 | 1170 | 1.0E+00 | 2550 | 9.5E-01 | 4050 | 1.8E-01 |
| 280 | 5.1E-01 | 580 | 1.0E+00 | 880 | 1.0E+00 | 1180 | 1.0E+00 | 2600 | 9.4E-01 | 4100 | 1.6E-01 |
| 290 | 7.2E-01 | 590 | 1.0E+00 | 890 | 1.0E+00 | 1190 | 1.0E+00 | 2650 | 9.3E-01 | 4150 | 1.4E-01 |
| 300 | 8.6E-01 | 600 | 1.0E+00 | 900 | 1.0E+00 | 1200 | 1.0E+00 | 2700 | 8.5E-01 | 4200 | 1.2E-01 |
| 310 | 9.3E-01 | 610 | 1.0E+00 | 910 | 1.0E+00 | 1250 | 1.0E+00 | 2750 | 4.4E-01 | 4250 | 9.0E-02 |
| 320 | 9.6E-01 | 620 | 1.0E+00 | 920 | 1.0E+00 | 1300 | 1.0E+00 | 2800 | 4.1E-01 | 4300 | 6.4E-02 |
| 330 | 9.8E-01 | 630 | 1.0E+00 | 930 | 1.0E+00 | 1350 | 1.0E+00 | 2850 | 4.4E-01 | 4350 | 4.1E-02 |
| 340 | 9.8E-01 | 640 | 1.0E+00 | 940 | 1.0E+00 | 1400 | 1.0E+00 | 2900 | 4.7E-01 | 4400 | 2.2E-02 |
| 350 | 9.9E-01 | 650 | 1.0E+00 | 950 | 1.0E+00 | 1450 | 1.0E+00 | 2950 | 4.9E-01 | 4450 | 1.0E-02 |
| 360 | 9.9E-01 | 660 | 1.0E+00 | 960 | 1.0E+00 | 1500 | 1.0E+00 | 3000 | 4.9E-01 | 4500 | 4.3E-03 |
| 370 | 9.9E-01 | 670 | 1.0E+00 | 970 | 1.0E+00 | 1550 | 1.0E+00 | 3050 | 4.9E-01 | 4550 | 1.4E-03 |
| 380 | 9.9E-01 | 680 | 1.0E+00 | 980 | 1.0E+00 | 1600 | 1.0E+00 | 3100 | 4.9E-01 | 4600 | 4.1E-04 |
| 390 | 9.9E-01 | 690 | 1.0E+00 | 990 | 1.0E+00 | 1650 | 1.0E+00 | 3150 | 4.8E-01 | 4650 | 1.2E-04 |
| 400 | 9.9E-01 | 700 | 1.0E+00 | 1000 | 1.0E+00 | 1700 | 1.0E+00 | 3200 | 4.7E-01 | 4700 | 4.2E-05 |
| 410 | 1.0E+00 | 710 | 1.0E+00 | 1010 | 1.0E+00 | 1750 | 1.0E+00 | 3250 | 4.6E-01 | 4750 | 1.6E-05 |
| 420 | 1.0E+00 | 720 | 1.0E+00 | 1020 | 1.0E+00 | 1800 | 1.0E+00 | 3300 | 4.4E-01 | 4800 | < 1.0E-05 |
| 430 | 1.0E+00 | 730 | 1.0E+00 | 1030 | 1.0E+00 | 1850 | 1.0E+00 | 3350 | 4.2E-01 | 4850 | < 1.0E-05 |
| 440 | 1.0E+00 | 740 | 1.0E+00 | 1040 | 1.0E+00 | 1900 | 1.0E+00 | 3400 | 3.9E-01 | 4900 | < 1.0E-05 |
| 450 | 1.0E+00 | 750 | 1.0E+00 | 1050 | 1.0E+00 | 1950 | 1.0E+00 | 3450 | 3.5E-01 | 4950 | < 1.0E-05 |
| 460 | 1.0E+00 | 760 | 1.0E+00 | 1060 | 1.0E+00 | 2000 | 1.0E+00 | 3500 | 3.1E-01 | 5000 | < 1.0E-05 |
| 470 | 1.0E+00 | 770 | 1.0E+00 | 1070 | 1.0E+00 | 2050 | 9.9E-01 | 3550 | 2.7E-01 | 5050 | < 1.0E-05 |
| 480 | 1.0E+00 | 780 | 1.0E+00 | 1080 | 1.0E+00 | 2100 | 9.9E-01 | 3600 | 2.4E-01 | 5100 | < 1.0E-05 |
| 490 | 1.0E+00 | 790 | 1.0E+00 | 1090 | 1.0E+00 | 2150 | 9.9E-01 | 3650 | 2.2E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## N-WG295

| Density | |
|---|---|
| ρ [g/cm³] | 2.51 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Bubble content | |
|---|---|
| Bubble class | 1 |

| Reference thickness | |
|---|---|
| d [mm] | 2 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 2.0 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 295 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 250 | |
| λp (τip = 0.99) [nm] | = | 400 | |

| Transformation temperature | |
|---|---|
| Tg [°C] | 565 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.2 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 8.4 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 296.7 | Hg | 1.55 |
| 587.6 | He | 1.52 |
| 1014 | Hg | 1.51 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.06 |

| Notes |
|---|
| |
| Base glass |
| |
| Long pass filter |

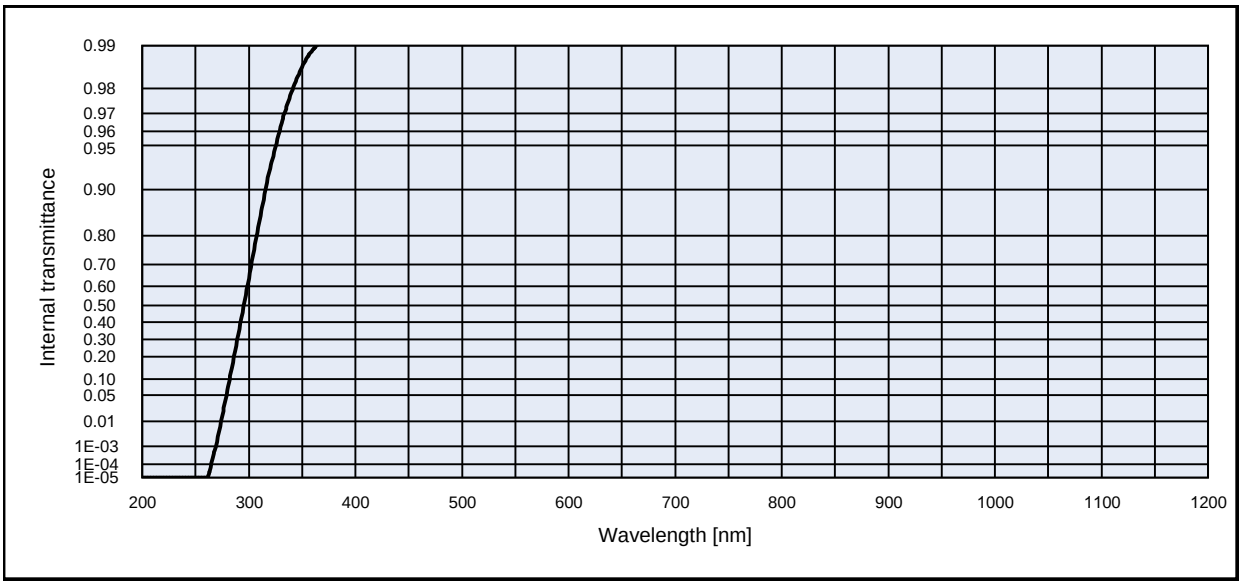
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# N-WG295

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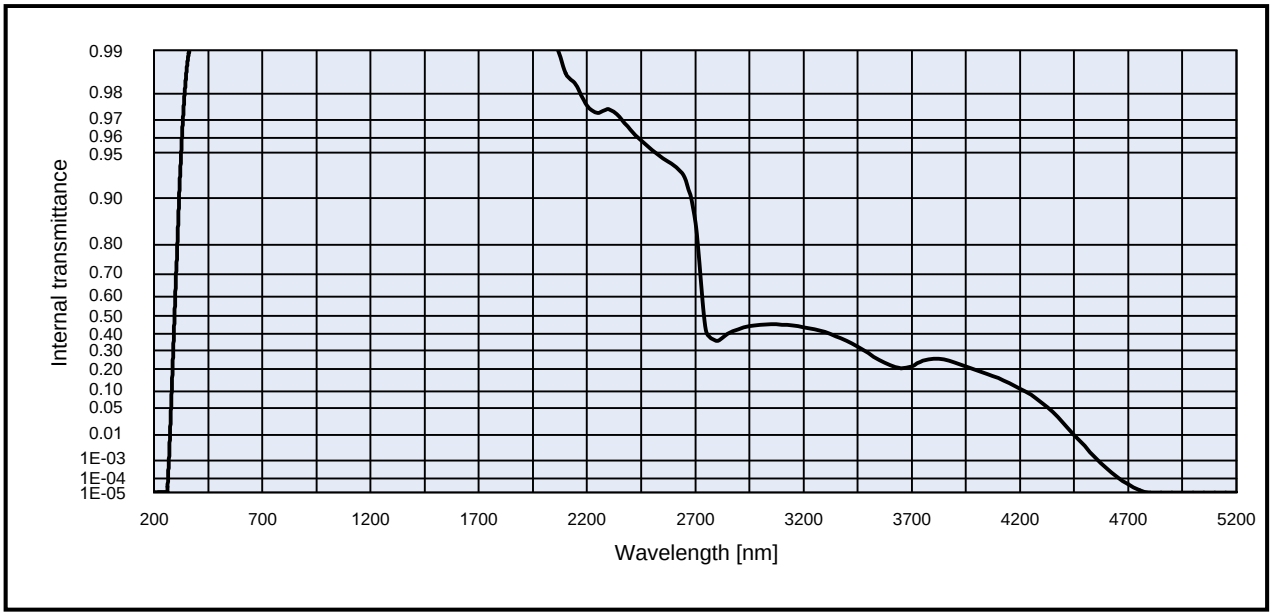



**Internal transmittance $\tau_i$ at reference thickness d [mm] = 2**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 1.0E+00 | 800 | 1.0E+00 | 1100 | 1.0E+00 | 2200 | 9.8E-01 | 3700 | 2.1E-01 |
| 210 | < 1.0E-05 | 510 | 1.0E+00 | 810 | 1.0E+00 | 1110 | 1.0E+00 | 2250 | 9.7E-01 | 3750 | 2.5E-01 |
| 220 | < 1.0E-05 | 520 | 1.0E+00 | 820 | 1.0E+00 | 1120 | 1.0E+00 | 2300 | 9.7E-01 | 3800 | 2.6E-01 |
| 230 | < 1.0E-05 | 530 | 1.0E+00 | 830 | 1.0E+00 | 1130 | 1.0E+00 | 2350 | 9.7E-01 | 3850 | 2.5E-01 |
| 240 | < 1.0E-05 | 540 | 1.0E+00 | 840 | 1.0E+00 | 1140 | 1.0E+00 | 2400 | 9.7E-01 | 3900 | 2.3E-01 |
| 250 | < 1.0E-05 | 550 | 1.0E+00 | 850 | 1.0E+00 | 1150 | 1.0E+00 | 2450 | 9.6E-01 | 3950 | 2.1E-01 |
| 260 | < 1.0E-05 | 560 | 1.0E+00 | 860 | 1.0E+00 | 1160 | 1.0E+00 | 2500 | 9.5E-01 | 4000 | 1.9E-01 |
| 270 | 1.6E-03 | 570 | 1.0E+00 | 870 | 1.0E+00 | 1170 | 1.0E+00 | 2550 | 9.5E-01 | 4050 | 1.8E-01 |
| 280 | 6.4E-02 | 580 | 1.0E+00 | 880 | 1.0E+00 | 1180 | 1.0E+00 | 2600 | 9.4E-01 | 4100 | 1.6E-01 |
| 290 | 3.3E-01 | 590 | 1.0E+00 | 890 | 1.0E+00 | 1190 | 1.0E+00 | 2650 | 9.3E-01 | 4150 | 1.3E-01 |
| 300 | 6.4E-01 | 600 | 1.0E+00 | 900 | 1.0E+00 | 1200 | 1.0E+00 | 2700 | 8.5E-01 | 4200 | 1.1E-01 |
| 310 | 8.4E-01 | 610 | 1.0E+00 | 910 | 1.0E+00 | 1250 | 1.0E+00 | 2750 | 4.2E-01 | 4250 | 8.8E-02 |
| 320 | 9.3E-01 | 620 | 1.0E+00 | 920 | 1.0E+00 | 1300 | 1.0E+00 | 2800 | 3.6E-01 | 4300 | 6.4E-02 |
| 330 | 9.6E-01 | 630 | 1.0E+00 | 930 | 1.0E+00 | 1350 | 1.0E+00 | 2850 | 4.0E-01 | 4350 | 4.1E-02 |
| 340 | 9.8E-01 | 640 | 1.0E+00 | 940 | 1.0E+00 | 1400 | 1.0E+00 | 2900 | 4.2E-01 | 4400 | 2.2E-02 |
| 350 | 9.9E-01 | 650 | 1.0E+00 | 950 | 1.0E+00 | 1450 | 1.0E+00 | 2950 | 4.4E-01 | 4450 | 1.0E-02 |
| 360 | 9.9E-01 | 660 | 1.0E+00 | 960 | 1.0E+00 | 1500 | 1.0E+00 | 3000 | 4.5E-01 | 4500 | 4.3E-03 |
| 370 | 9.9E-01 | 670 | 1.0E+00 | 970 | 1.0E+00 | 1550 | 1.0E+00 | 3050 | 4.5E-01 | 4550 | 1.4E-03 |
| 380 | 9.9E-01 | 680 | 1.0E+00 | 980 | 1.0E+00 | 1600 | 1.0E+00 | 3100 | 4.5E-01 | 4600 | 4.1E-04 |
| 390 | 9.9E-01 | 690 | 1.0E+00 | 990 | 1.0E+00 | 1650 | 1.0E+00 | 3150 | 4.5E-01 | 4650 | 1.2E-04 |
| 400 | 9.9E-01 | 700 | 1.0E+00 | 1000 | 1.0E+00 | 1700 | 1.0E+00 | 3200 | 4.4E-01 | 4700 | 4.2E-05 |
| 410 | 9.9E-01 | 710 | 1.0E+00 | 1010 | 1.0E+00 | 1750 | 1.0E+00 | 3250 | 4.3E-01 | 4750 | 1.6E-05 |
| 420 | 9.9E-01 | 720 | 1.0E+00 | 1020 | 1.0E+00 | 1800 | 1.0E+00 | 3300 | 4.1E-01 | 4800 | < 1.0E-05 |
| 430 | 9.9E-01 | 730 | 1.0E+00 | 1030 | 1.0E+00 | 1850 | 1.0E+00 | 3350 | 3.9E-01 | 4850 | < 1.0E-05 |
| 440 | 9.9E-01 | 740 | 1.0E+00 | 1040 | 1.0E+00 | 1900 | 1.0E+00 | 3400 | 3.6E-01 | 4900 | < 1.0E-05 |
| 450 | 1.0E+00 | 750 | 1.0E+00 | 1050 | 1.0E+00 | 1950 | 9.9E-01 | 3450 | 3.2E-01 | 4950 | < 1.0E-05 |
| 460 | 1.0E+00 | 760 | 1.0E+00 | 1060 | 1.0E+00 | 2000 | 9.9E-01 | 3500 | 2.9E-01 | 5000 | < 1.0E-05 |
| 470 | 1.0E+00 | 770 | 1.0E+00 | 1070 | 1.0E+00 | 2050 | 9.9E-01 | 3550 | 2.5E-01 | 5050 | < 1.0E-05 |
| 480 | 1.0E+00 | 780 | 1.0E+00 | 1080 | 1.0E+00 | 2100 | 9.9E-01 | 3600 | 2.2E-01 | 5100 | < 1.0E-05 |
| 490 | 1.0E+00 | 790 | 1.0E+00 | 1090 | 1.0E+00 | 2150 | 9.8E-01 | 3650 | 2.0E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## N-WG305

| Density | |
|---|---|
| ρ [g/cm³] | 2.51 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Bubble content | |
|---|---|
| Bubble class | 1 |

| Reference thickness | |
|---|---|
| d [mm] | 2 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 2.0 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 305 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 260 | |
| λp (τip = 0.99) [nm] | = | 420 | |

| Transformation temperature | |
|---|---|
| Tg [°C] | 562 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.1 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 8.4 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 365 | Hg | 1.54 |
| 587.6 | He | 1.52 |
| 1014 | Hg | 1.51 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.06 |

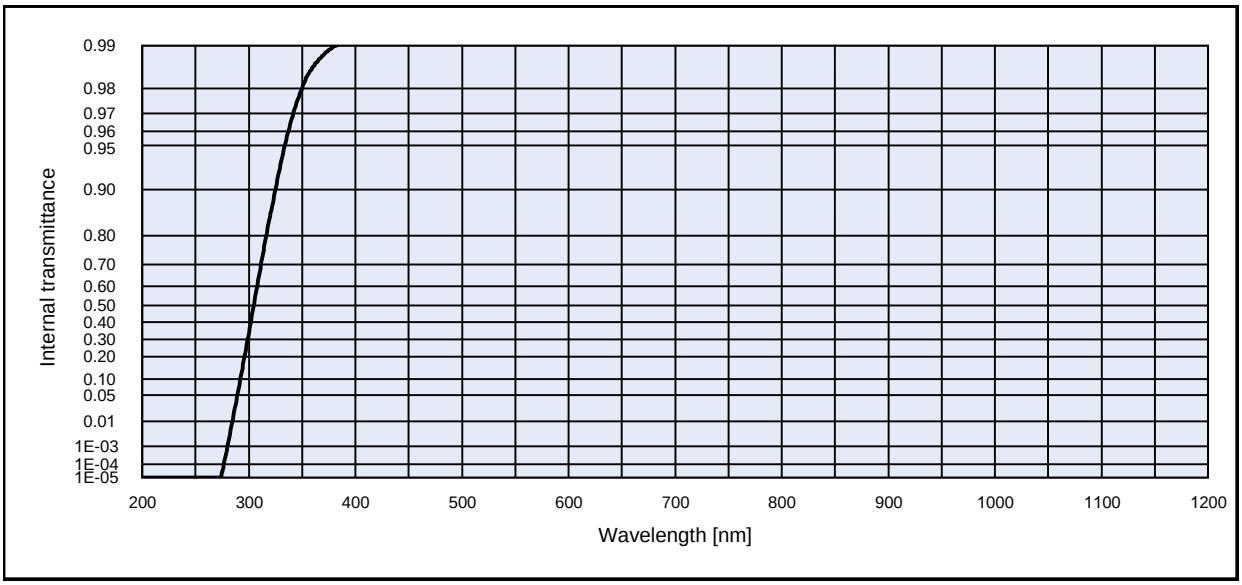
| Notes |
|---|
| |
| Base glass |
| |
| Long pass filter |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

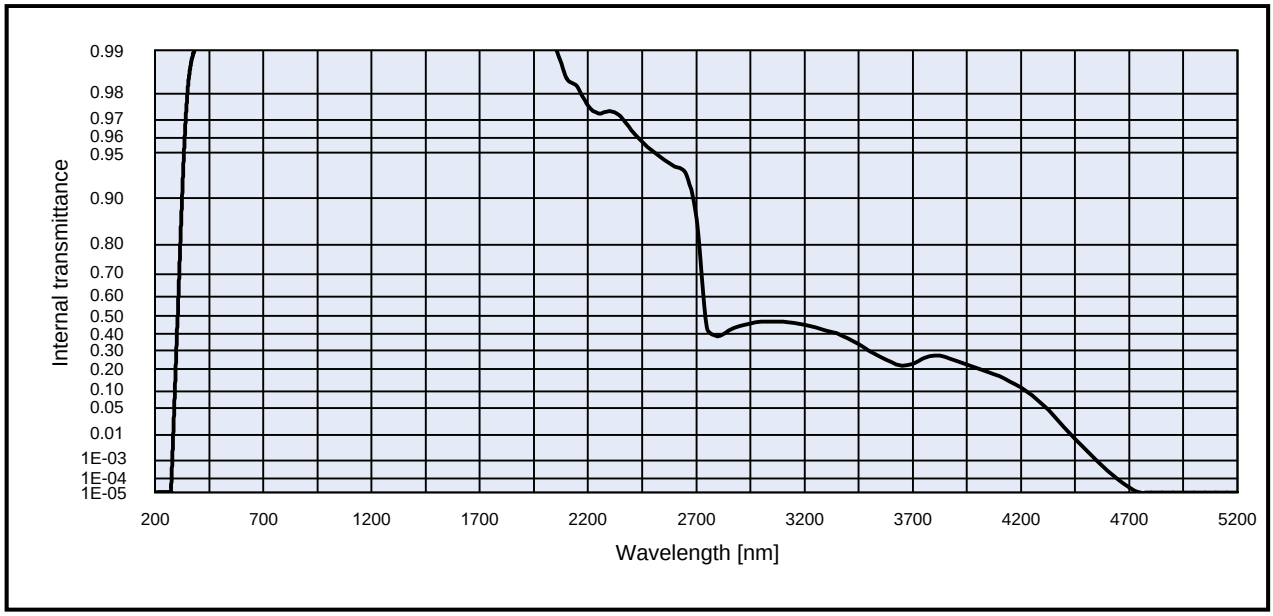
| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# N-WG305

SCHOTT




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 2**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.9E-01 | 800 | 1.0E+00 | 1100 | 1.0E+00 | 2200 | 9.8E-01 | 3700 | 2.3E-01 |
| 210 | < 1.0E-05 | 510 | 1.0E+00 | 810 | 1.0E+00 | 1110 | 1.0E+00 | 2250 | 9.7E-01 | 3750 | 2.6E-01 |
| 220 | < 1.0E-05 | 520 | 1.0E+00 | 820 | 1.0E+00 | 1120 | 1.0E+00 | 2300 | 9.7E-01 | 3800 | 2.7E-01 |
| 230 | < 1.0E-05 | 530 | 1.0E+00 | 830 | 1.0E+00 | 1130 | 1.0E+00 | 2350 | 9.7E-01 | 3850 | 2.7E-01 |
| 240 | < 1.0E-05 | 540 | 1.0E+00 | 840 | 1.0E+00 | 1140 | 1.0E+00 | 2400 | 9.6E-01 | 3900 | 2.5E-01 |
| 250 | < 1.0E-05 | 550 | 1.0E+00 | 850 | 1.0E+00 | 1150 | 1.0E+00 | 2450 | 9.6E-01 | 3950 | 2.2E-01 |
| 260 | < 1.0E-05 | 560 | 1.0E+00 | 860 | 1.0E+00 | 1160 | 1.0E+00 | 2500 | 9.5E-01 | 4000 | 2.0E-01 |
| 270 | < 1.0E-05 | 570 | 1.0E+00 | 870 | 1.0E+00 | 1170 | 1.0E+00 | 2550 | 9.4E-01 | 4050 | 1.9E-01 |
| 280 | 1.0E-03 | 580 | 1.0E+00 | 880 | 1.0E+00 | 1180 | 1.0E+00 | 2600 | 9.4E-01 | 4100 | 1.7E-01 |
| 290 | 6.2E-02 | 590 | 1.0E+00 | 890 | 1.0E+00 | 1190 | 1.0E+00 | 2650 | 9.3E-01 | 4150 | 1.4E-01 |
| 300 | 3.4E-01 | 600 | 1.0E+00 | 900 | 1.0E+00 | 1200 | 1.0E+00 | 2700 | 8.6E-01 | 4200 | 1.1E-01 |
| 310 | 6.6E-01 | 610 | 1.0E+00 | 910 | 1.0E+00 | 1250 | 1.0E+00 | 2750 | 4.3E-01 | 4250 | 8.7E-02 |
| 320 | 8.5E-01 | 620 | 1.0E+00 | 920 | 1.0E+00 | 1300 | 1.0E+00 | 2800 | 3.9E-01 | 4300 | 5.8E-02 |
| 330 | 9.3E-01 | 630 | 1.0E+00 | 930 | 1.0E+00 | 1350 | 1.0E+00 | 2850 | 4.2E-01 | 4350 | 3.4E-02 |
| 340 | 9.7E-01 | 640 | 1.0E+00 | 940 | 1.0E+00 | 1400 | 1.0E+00 | 2900 | 4.4E-01 | 4400 | 1.7E-02 |
| 350 | 9.8E-01 | 650 | 1.0E+00 | 950 | 1.0E+00 | 1450 | 1.0E+00 | 2950 | 4.6E-01 | 4450 | 7.4E-03 |
| 360 | 9.9E-01 | 660 | 1.0E+00 | 960 | 1.0E+00 | 1500 | 1.0E+00 | 3000 | 4.7E-01 | 4500 | 2.9E-03 |
| 370 | 9.9E-01 | 670 | 1.0E+00 | 970 | 1.0E+00 | 1550 | 1.0E+00 | 3050 | 4.7E-01 | 4550 | 9.6E-04 |
| 380 | 9.9E-01 | 680 | 1.0E+00 | 980 | 1.0E+00 | 1600 | 1.0E+00 | 3100 | 4.7E-01 | 4600 | 2.9E-04 |
| 390 | 9.9E-01 | 690 | 1.0E+00 | 990 | 1.0E+00 | 1650 | 1.0E+00 | 3150 | 4.6E-01 | 4650 | 8.5E-05 |
| 400 | 9.9E-01 | 700 | 1.0E+00 | 1000 | 1.0E+00 | 1700 | 1.0E+00 | 3200 | 4.5E-01 | 4700 | 2.5E-05 |
| 410 | 9.9E-01 | 710 | 1.0E+00 | 1010 | 1.0E+00 | 1750 | 1.0E+00 | 3250 | 4.4E-01 | 4750 | < 1.0E-05 |
| 420 | 9.9E-01 | 720 | 1.0E+00 | 1020 | 1.0E+00 | 1800 | 1.0E+00 | 3300 | 4.2E-01 | 4800 | < 1.0E-05 |
| 430 | 9.9E-01 | 730 | 1.0E+00 | 1030 | 1.0E+00 | 1850 | 1.0E+00 | 3350 | 4.0E-01 | 4850 | < 1.0E-05 |
| 440 | 9.9E-01 | 740 | 1.0E+00 | 1040 | 1.0E+00 | 1900 | 9.9E-01 | 3400 | 3.7E-01 | 4900 | < 1.0E-05 |
| 450 | 9.9E-01 | 750 | 1.0E+00 | 1050 | 1.0E+00 | 1950 | 9.9E-01 | 3450 | 3.4E-01 | 4950 | < 1.0E-05 |
| 460 | 9.9E-01 | 760 | 1.0E+00 | 1060 | 1.0E+00 | 2000 | 9.9E-01 | 3500 | 3.0E-01 | 5000 | < 1.0E-05 |
| 470 | 9.9E-01 | 770 | 1.0E+00 | 1070 | 1.0E+00 | 2050 | 9.9E-01 | 3550 | 2.6E-01 | 5050 | < 1.0E-05 |
| 480 | 9.9E-01 | 780 | 1.0E+00 | 1080 | 1.0E+00 | 2100 | 9.8E-01 | 3600 | 2.4E-01 | 5100 | < 1.0E-05 |
| 490 | 9.9E-01 | 790 | 1.0E+00 | 1090 | 1.0E+00 | 2150 | 9.8E-01 | 3650 | 2.2E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## N-WG320

| Density | |
|---|---|
| ρ [g/cm³] | 2.51 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Bubble content | |
|---|---|
| Bubble class | 1 |

| Reference thickness | |
|---|---|
| d [mm] | 2 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 2.0 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 320 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 280 | |
| λp (τip = 0.99) [nm] | = | 470 | |

| Transformation temperature | |
|---|---|
| Tg [°C] | 563 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.1 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 8.4 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 365 | Hg | 1.54 |
| 587.6 | He | 1.52 |
| 1014 | Hg | 1.51 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.06 |

| Notes |
|---|
| |
| Base glass |
| |
| Long pass filter |
| |
| |
| |
| |
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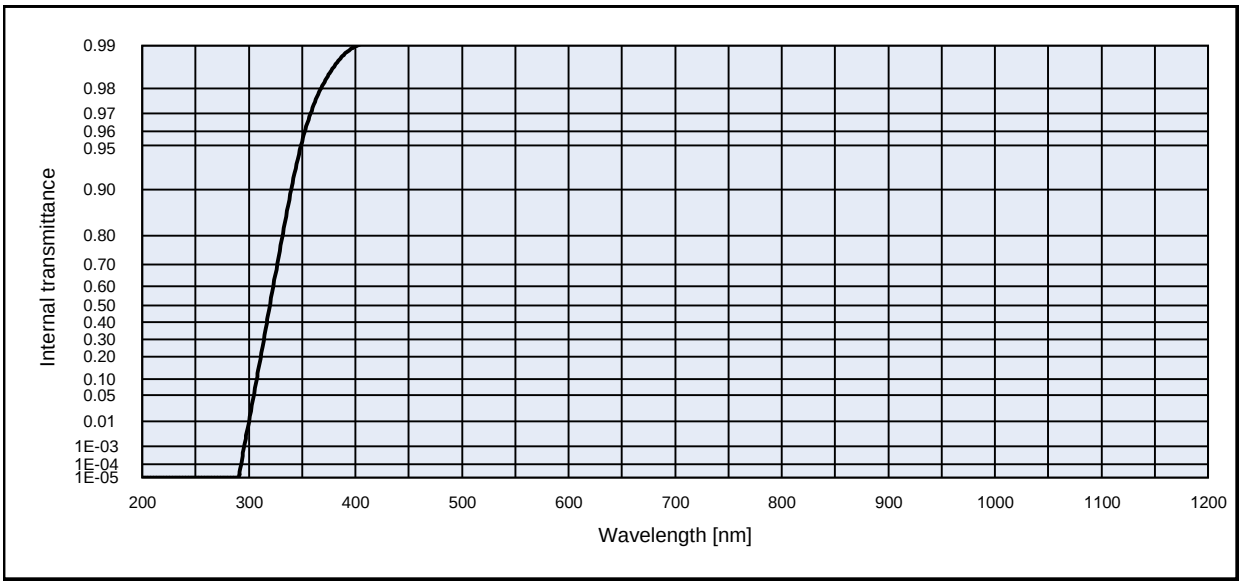
| |
| |
| |
| |
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

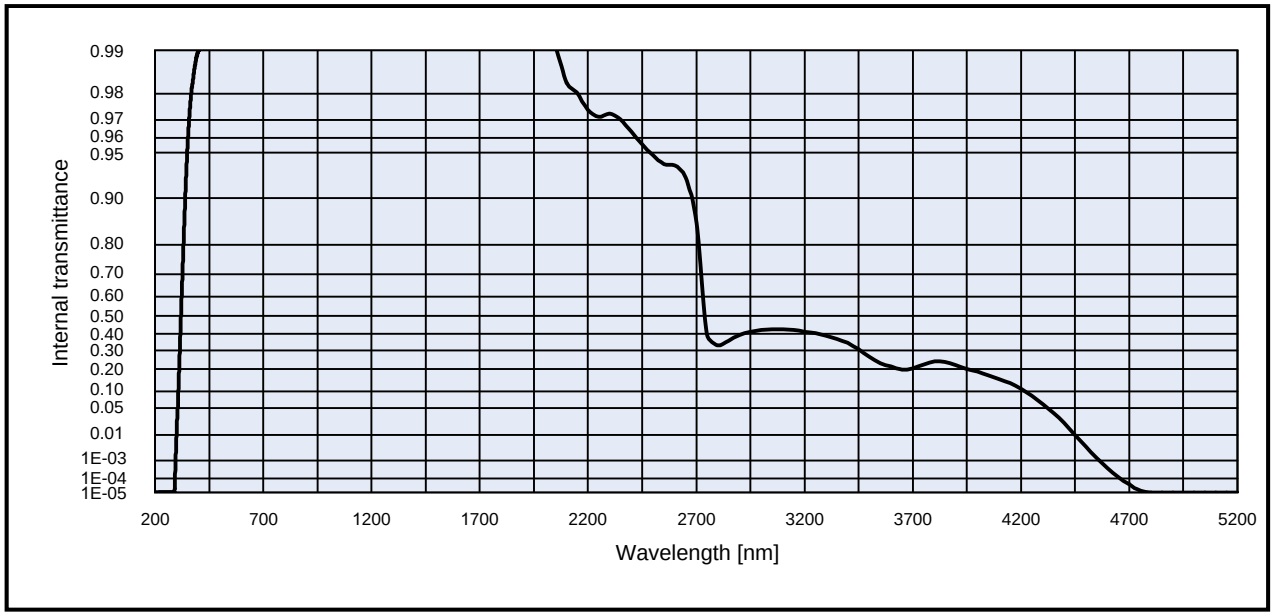
| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# N-WG320

SCHOTT




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 2**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.9E-01 | 800 | 1.0E+00 | 1100 | 1.0E+00 | 2200 | 9.7E-01 | 3700 | 2.0E-01 |
| 210 | < 1.0E-05 | 510 | 9.9E-01 | 810 | 1.0E+00 | 1110 | 1.0E+00 | 2250 | 9.7E-01 | 3750 | 2.2E-01 |
| 220 | < 1.0E-05 | 520 | 9.9E-01 | 820 | 1.0E+00 | 1120 | 1.0E+00 | 2300 | 9.7E-01 | 3800 | 2.4E-01 |
| 230 | < 1.0E-05 | 530 | 9.9E-01 | 830 | 1.0E+00 | 1130 | 1.0E+00 | 2350 | 9.7E-01 | 3850 | 2.4E-01 |
| 240 | < 1.0E-05 | 540 | 1.0E+00 | 840 | 1.0E+00 | 1140 | 1.0E+00 | 2400 | 9.6E-01 | 3900 | 2.2E-01 |
| 250 | < 1.0E-05 | 550 | 1.0E+00 | 850 | 1.0E+00 | 1150 | 1.0E+00 | 2450 | 9.6E-01 | 3950 | 2.0E-01 |
| 260 | < 1.0E-05 | 560 | 1.0E+00 | 860 | 1.0E+00 | 1160 | 1.0E+00 | 2500 | 9.5E-01 | 4000 | 1.9E-01 |
| 270 | < 1.0E-05 | 570 | 1.0E+00 | 870 | 1.0E+00 | 1170 | 1.0E+00 | 2550 | 9.4E-01 | 4050 | 1.7E-01 |
| 280 | < 1.0E-05 | 580 | 1.0E+00 | 880 | 1.0E+00 | 1180 | 1.0E+00 | 2600 | 9.4E-01 | 4100 | 1.5E-01 |
| 290 | < 1.0E-05 | 590 | 1.0E+00 | 890 | 1.0E+00 | 1190 | 1.0E+00 | 2650 | 9.3E-01 | 4150 | 1.3E-01 |
| 300 | 9.6E-03 | 600 | 1.0E+00 | 900 | 1.0E+00 | 1200 | 1.0E+00 | 2700 | 8.5E-01 | 4200 | 1.1E-01 |
| 310 | 1.6E-01 | 610 | 1.0E+00 | 910 | 1.0E+00 | 1250 | 1.0E+00 | 2750 | 4.0E-01 | 4250 | 8.4E-02 |
| 320 | 5.1E-01 | 620 | 1.0E+00 | 920 | 1.0E+00 | 1300 | 1.0E+00 | 2800 | 3.3E-01 | 4300 | 6.0E-02 |
| 330 | 7.7E-01 | 630 | 1.0E+00 | 930 | 1.0E+00 | 1350 | 1.0E+00 | 2850 | 3.6E-01 | 4350 | 3.9E-02 |
| 340 | 9.0E-01 | 640 | 1.0E+00 | 940 | 1.0E+00 | 1400 | 1.0E+00 | 2900 | 3.9E-01 | 4400 | 2.2E-02 |
| 350 | 9.5E-01 | 650 | 1.0E+00 | 950 | 1.0E+00 | 1450 | 1.0E+00 | 2950 | 4.1E-01 | 4450 | 1.0E-02 |
| 360 | 9.7E-01 | 660 | 1.0E+00 | 960 | 1.0E+00 | 1500 | 1.0E+00 | 3000 | 4.2E-01 | 4500 | 4.0E-03 |
| 370 | 9.8E-01 | 670 | 1.0E+00 | 970 | 1.0E+00 | 1550 | 1.0E+00 | 3050 | 4.2E-01 | 4550 | 1.3E-03 |
| 380 | 9.9E-01 | 680 | 1.0E+00 | 980 | 1.0E+00 | 1600 | 1.0E+00 | 3100 | 4.2E-01 | 4600 | 4.1E-04 |
| 390 | 9.9E-01 | 690 | 1.0E+00 | 990 | 1.0E+00 | 1650 | 1.0E+00 | 3150 | 4.2E-01 | 4650 | 1.2E-04 |
| 400 | 9.9E-01 | 700 | 1.0E+00 | 1000 | 1.0E+00 | 1700 | 1.0E+00 | 3200 | 4.1E-01 | 4700 | 4.2E-05 |
| 410 | 9.9E-01 | 710 | 1.0E+00 | 1010 | 1.0E+00 | 1750 | 1.0E+00 | 3250 | 4.0E-01 | 4750 | 1.4E-05 |
| 420 | 9.9E-01 | 720 | 1.0E+00 | 1020 | 1.0E+00 | 1800 | 1.0E+00 | 3300 | 3.9E-01 | 4800 | < 1.0E-05 |
| 430 | 9.9E-01 | 730 | 1.0E+00 | 1030 | 1.0E+00 | 1850 | 1.0E+00 | 3350 | 3.7E-01 | 4850 | < 1.0E-05 |
| 440 | 9.9E-01 | 740 | 1.0E+00 | 1040 | 1.0E+00 | 1900 | 1.0E+00 | 3400 | 3.5E-01 | 4900 | < 1.0E-05 |
| 450 | 9.9E-01 | 750 | 1.0E+00 | 1050 | 1.0E+00 | 1950 | 9.9E-01 | 3450 | 3.1E-01 | 4950 | < 1.0E-05 |
| 460 | 9.9E-01 | 760 | 1.0E+00 | 1060 | 1.0E+00 | 2000 | 9.9E-01 | 3500 | 2.7E-01 | 5000 | < 1.0E-05 |
| 470 | 9.9E-01 | 770 | 1.0E+00 | 1070 | 1.0E+00 | 2050 | 9.9E-01 | 3550 | 2.3E-01 | 5050 | < 1.0E-05 |
| 480 | 9.9E-01 | 780 | 1.0E+00 | 1080 | 1.0E+00 | 2100 | 9.8E-01 | 3600 | 2.1E-01 | 5100 | < 1.0E-05 |
| 490 | 9.9E-01 | 790 | 1.0E+00 | 1090 | 1.0E+00 | 2150 | 9.8E-01 | 3650 | 2.0E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## OG515

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 515 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 440 | |
| λp (τip = 0.93) [nm] | = | 580 | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 546 | Hg | 1.51 |
| 587.6 | He | 1.51 |
| 852 | Cs | 1.51 |
| 1014 | Hg | 1.50 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.56 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 509 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.9 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.0 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.11 |

| Notes |
|---|
| |
| Colloidally colored glass |
| |
| Long pass filter |

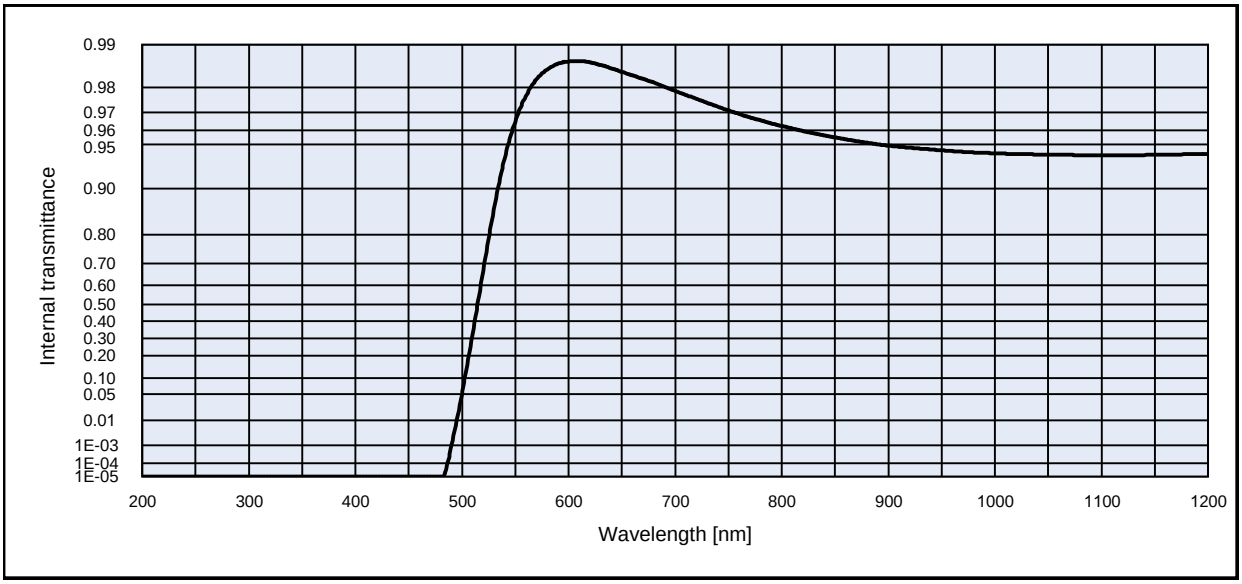
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.516 | 0.525 | 0.530 |
| y | 0.468 | 0.466 | 0.463 |
| Y | 87 | 84 | 82 |
| $\lambda_d$ [nm] | 582 | 583 | 583 |
| $P_e$ | 0.90 | 0.94 | 0.96 |

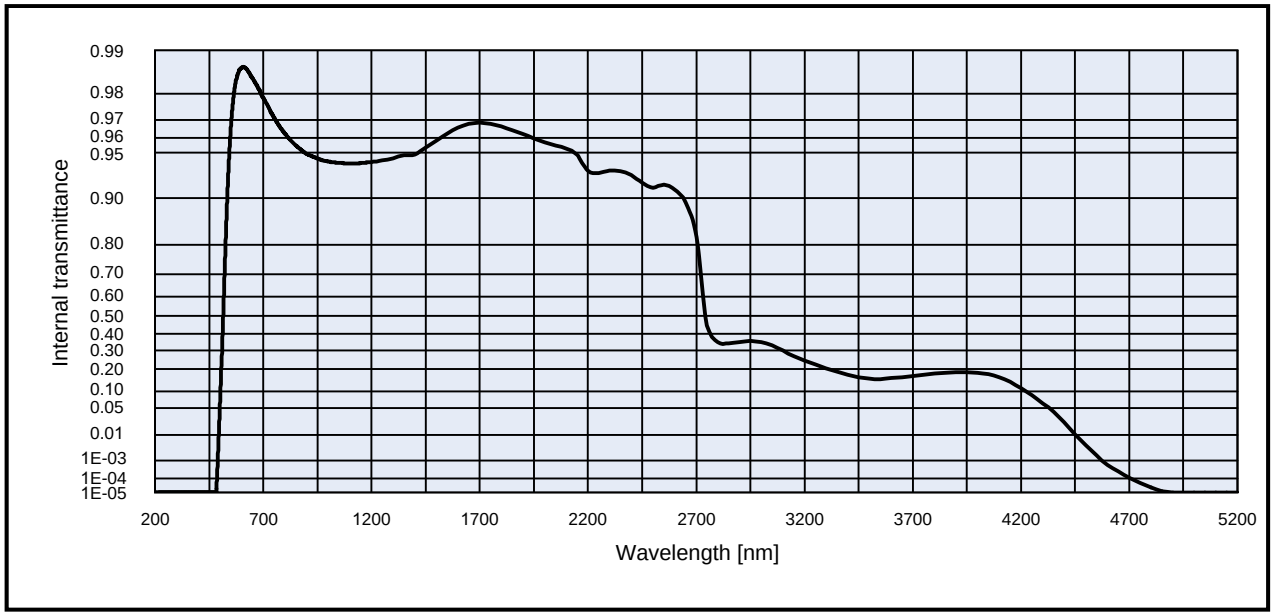
| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.505 | 0.515 | 0.520 |
| y | 0.477 | 0.475 | 0.472 |
| Y | 86 | 83 | 81 |
| $\lambda_d$ [nm] | 580 | 581 | 582 |
| $P_e$ | 0.90 | 0.95 | 0.96 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.448 | 0.465 | 0.473 |
| y | 0.516 | 0.519 | 0.515 |
| Y | 81 | 78 | 75 |
| $\lambda_d$ [nm] | 573 | 574 | 575 |
| $P_e$ | 0.90 | 0.96 | 0.97 |



# OG515

SCHOTT




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 5.1E-02 | 800 | 9.6E-01 | 1100 | 9.4E-01 | 2200 | 9.3E-01 | 3700 | 1.7E-01 |
| 210 | < 1.0E-05 | 510 | 3.2E-01 | 810 | 9.6E-01 | 1110 | 9.4E-01 | 2250 | 9.3E-01 | 3750 | 1.7E-01 |
| 220 | < 1.0E-05 | 520 | 6.7E-01 | 820 | 9.6E-01 | 1120 | 9.4E-01 | 2300 | 9.3E-01 | 3800 | 1.8E-01 |
| 230 | < 1.0E-05 | 530 | 8.6E-01 | 830 | 9.6E-01 | 1130 | 9.4E-01 | 2350 | 9.3E-01 | 3850 | 1.8E-01 |
| 240 | < 1.0E-05 | 540 | 9.4E-01 | 840 | 9.6E-01 | 1140 | 9.4E-01 | 2400 | 9.3E-01 | 3900 | 1.8E-01 |
| 250 | < 1.0E-05 | 550 | 9.7E-01 | 850 | 9.6E-01 | 1150 | 9.4E-01 | 2450 | 9.2E-01 | 3950 | 1.8E-01 |
| 260 | < 1.0E-05 | 560 | 9.8E-01 | 860 | 9.5E-01 | 1160 | 9.4E-01 | 2500 | 9.1E-01 | 4000 | 1.8E-01 |
| 270 | < 1.0E-05 | 570 | 9.8E-01 | 870 | 9.5E-01 | 1170 | 9.4E-01 | 2550 | 9.2E-01 | 4050 | 1.7E-01 |
| 280 | < 1.0E-05 | 580 | 9.9E-01 | 880 | 9.5E-01 | 1180 | 9.4E-01 | 2600 | 9.1E-01 | 4100 | 1.6E-01 |
| 290 | < 1.0E-05 | 590 | 9.9E-01 | 890 | 9.5E-01 | 1190 | 9.4E-01 | 2650 | 8.9E-01 | 4150 | 1.4E-01 |
| 300 | < 1.0E-05 | 600 | 9.9E-01 | 900 | 9.5E-01 | 1200 | 9.4E-01 | 2700 | 8.2E-01 | 4200 | 1.1E-01 |
| 310 | < 1.0E-05 | 610 | 9.9E-01 | 910 | 9.5E-01 | 1250 | 9.4E-01 | 2750 | 4.5E-01 | 4250 | 8.6E-02 |
| 320 | < 1.0E-05 | 620 | 9.9E-01 | 920 | 9.5E-01 | 1300 | 9.5E-01 | 2800 | 3.5E-01 | 4300 | 6.2E-02 |
| 330 | < 1.0E-05 | 630 | 9.9E-01 | 930 | 9.5E-01 | 1350 | 9.5E-01 | 2850 | 3.4E-01 | 4350 | 4.1E-02 |
| 340 | < 1.0E-05 | 640 | 9.9E-01 | 940 | 9.5E-01 | 1400 | 9.5E-01 | 2900 | 3.5E-01 | 4400 | 2.3E-02 |
| 350 | < 1.0E-05 | 650 | 9.8E-01 | 950 | 9.5E-01 | 1450 | 9.5E-01 | 2950 | 3.6E-01 | 4450 | 1.0E-02 |
| 360 | < 1.0E-05 | 660 | 9.8E-01 | 960 | 9.4E-01 | 1500 | 9.6E-01 | 3000 | 3.5E-01 | 4500 | 4.4E-03 |
| 370 | < 1.0E-05 | 670 | 9.8E-01 | 970 | 9.4E-01 | 1550 | 9.6E-01 | 3050 | 3.3E-01 | 4550 | 1.7E-03 |
| 380 | < 1.0E-05 | 680 | 9.8E-01 | 980 | 9.4E-01 | 1600 | 9.7E-01 | 3100 | 3.0E-01 | 4600 | 6.2E-04 |
| 390 | < 1.0E-05 | 690 | 9.8E-01 | 990 | 9.4E-01 | 1650 | 9.7E-01 | 3150 | 2.7E-01 | 4650 | 2.6E-04 |
| 400 | < 1.0E-05 | 700 | 9.8E-01 | 1000 | 9.4E-01 | 1700 | 9.7E-01 | 3200 | 2.4E-01 | 4700 | 1.1E-04 |
| 410 | < 1.0E-05 | 710 | 9.8E-01 | 1010 | 9.4E-01 | 1750 | 9.7E-01 | 3250 | 2.2E-01 | 4750 | 5.1E-05 |
| 420 | < 1.0E-05 | 720 | 9.8E-01 | 1020 | 9.4E-01 | 1800 | 9.7E-01 | 3300 | 2.0E-01 | 4800 | 2.4E-05 |
| 430 | < 1.0E-05 | 730 | 9.7E-01 | 1030 | 9.4E-01 | 1850 | 9.6E-01 | 3350 | 1.9E-01 | 4850 | 1.2E-05 |
| 440 | < 1.0E-05 | 740 | 9.7E-01 | 1040 | 9.4E-01 | 1900 | 9.6E-01 | 3400 | 1.7E-01 | 4900 | < 1.0E-05 |
| 450 | < 1.0E-05 | 750 | 9.7E-01 | 1050 | 9.4E-01 | 1950 | 9.6E-01 | 3450 | 1.6E-01 | 4950 | < 1.0E-05 |
| 460 | < 1.0E-05 | 760 | 9.7E-01 | 1060 | 9.4E-01 | 2000 | 9.6E-01 | 3500 | 1.5E-01 | 5000 | < 1.0E-05 |
| 470 | < 1.0E-05 | 770 | 9.7E-01 | 1070 | 9.4E-01 | 2050 | 9.5E-01 | 3550 | 1.5E-01 | 5050 | < 1.0E-05 |
| 480 | < 1.0E-05 | 780 | 9.7E-01 | 1080 | 9.4E-01 | 2100 | 9.5E-01 | 3600 | 1.5E-01 | 5100 | < 1.0E-05 |
| 490 | 9.7E-04 | 790 | 9.6E-01 | 1090 | 9.4E-01 | 2150 | 9.5E-01 | 3650 | 1.6E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## OG530

| Density | |
|---|---|
| ρ [g/cm³] | 2.56 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 530 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 460 | |
| λp (τip = 0.93) [nm] | = | 600 | |

| Transformation temperature | |
|---|---|
| Tg [°C] | 506 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.9 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.0 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 546 | Hg | 1.51 |
| 588 | He | 1.51 |
| 852 | Cs | 1.51 |
| 1014 | Hg | 1.50 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.11 |

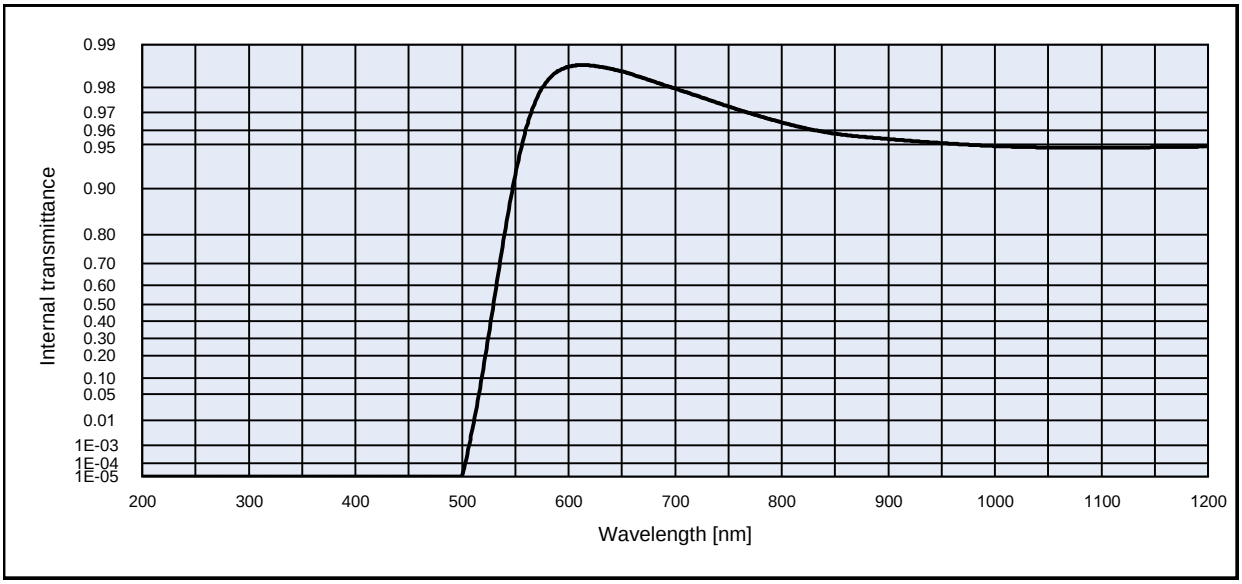
| Notes |
|---|
| |
| Colloidally colored glass |
| |
| Long pass filter |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.534 | 0.545 | 0.550 |
| y | 0.457 | 0.452 | 0.447 |
| Y | 81 | 78 | 75 |
| $\lambda_d$ [nm] | 584 | 585 | 586 |
| $P_e$ | 0.94 | 0.98 | 0.98 |

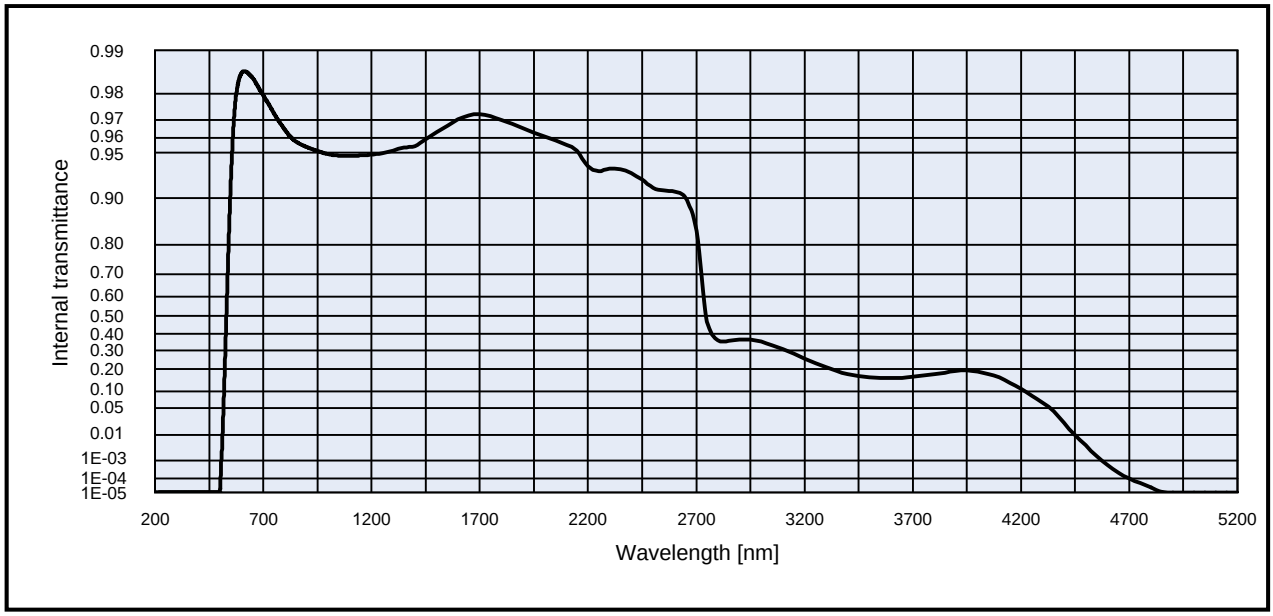
| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.524 | 0.536 | 0.542 |
| y | 0.466 | 0.460 | 0.454 |
| Y | 80 | 76 | 74 |
| $\lambda_d$ [nm] | 583 | 584 | 585 |
| $P_e$ | 0.94 | 0.98 | 0.99 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.476 | 0.496 | 0.505 |
| y | 0.501 | 0.498 | 0.490 |
| Y | 74 | 69 | 66 |
| $\lambda_d$ [nm] | 576 | 578 | 579 |
| $P_e$ | 0.94 | 0.99 | 0.99 |



# OG530

SCHOTT




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | < 1.0E-05 | 800 | 9.6E-01 | 1100 | 9.5E-01 | 2200 | 9.4E-01 | 3700 | 1.6E-01 |
| 210 | < 1.0E-05 | 510 | 5.2E-03 | 810 | 9.6E-01 | 1110 | 9.5E-01 | 2250 | 9.3E-01 | 3750 | 1.7E-01 |
| 220 | < 1.0E-05 | 520 | 1.4E-01 | 820 | 9.6E-01 | 1120 | 9.5E-01 | 2300 | 9.4E-01 | 3800 | 1.8E-01 |
| 230 | < 1.0E-05 | 530 | 5.1E-01 | 830 | 9.6E-01 | 1130 | 9.5E-01 | 2350 | 9.4E-01 | 3850 | 1.8E-01 |
| 240 | < 1.0E-05 | 540 | 8.0E-01 | 840 | 9.6E-01 | 1140 | 9.5E-01 | 2400 | 9.3E-01 | 3900 | 1.9E-01 |
| 250 | < 1.0E-05 | 550 | 9.2E-01 | 850 | 9.6E-01 | 1150 | 9.5E-01 | 2450 | 9.2E-01 | 3950 | 1.9E-01 |
| 260 | < 1.0E-05 | 560 | 9.6E-01 | 860 | 9.6E-01 | 1160 | 9.5E-01 | 2500 | 9.1E-01 | 4000 | 1.9E-01 |
| 270 | < 1.0E-05 | 570 | 9.8E-01 | 870 | 9.6E-01 | 1170 | 9.5E-01 | 2550 | 9.1E-01 | 4050 | 1.8E-01 |
| 280 | < 1.0E-05 | 580 | 9.8E-01 | 880 | 9.6E-01 | 1180 | 9.5E-01 | 2600 | 9.1E-01 | 4100 | 1.6E-01 |
| 290 | < 1.0E-05 | 590 | 9.8E-01 | 890 | 9.5E-01 | 1190 | 9.5E-01 | 2650 | 9.0E-01 | 4150 | 1.3E-01 |
| 300 | < 1.0E-05 | 600 | 9.9E-01 | 900 | 9.5E-01 | 1200 | 9.5E-01 | 2700 | 8.4E-01 | 4200 | 1.1E-01 |
| 310 | < 1.0E-05 | 610 | 9.9E-01 | 910 | 9.5E-01 | 1250 | 9.5E-01 | 2750 | 4.7E-01 | 4250 | 8.5E-02 |
| 320 | < 1.0E-05 | 620 | 9.9E-01 | 920 | 9.5E-01 | 1300 | 9.5E-01 | 2800 | 3.6E-01 | 4300 | 6.3E-02 |
| 330 | < 1.0E-05 | 630 | 9.9E-01 | 930 | 9.5E-01 | 1350 | 9.5E-01 | 2850 | 3.6E-01 | 4350 | 4.3E-02 |
| 340 | < 1.0E-05 | 640 | 9.9E-01 | 940 | 9.5E-01 | 1400 | 9.5E-01 | 2900 | 3.6E-01 | 4400 | 2.3E-02 |
| 350 | < 1.0E-05 | 650 | 9.8E-01 | 950 | 9.5E-01 | 1450 | 9.6E-01 | 2950 | 3.6E-01 | 4450 | 1.0E-02 |
| 360 | < 1.0E-05 | 660 | 9.8E-01 | 960 | 9.5E-01 | 1500 | 9.6E-01 | 3000 | 3.5E-01 | 4500 | 4.3E-03 |
| 370 | < 1.0E-05 | 670 | 9.8E-01 | 970 | 9.5E-01 | 1550 | 9.7E-01 | 3050 | 3.3E-01 | 4550 | 1.6E-03 |
| 380 | < 1.0E-05 | 680 | 9.8E-01 | 980 | 9.5E-01 | 1600 | 9.7E-01 | 3100 | 3.1E-01 | 4600 | 5.9E-04 |
| 390 | < 1.0E-05 | 690 | 9.8E-01 | 990 | 9.5E-01 | 1650 | 9.7E-01 | 3150 | 2.8E-01 | 4650 | 2.3E-04 |
| 400 | < 1.0E-05 | 700 | 9.8E-01 | 1000 | 9.5E-01 | 1700 | 9.7E-01 | 3200 | 2.6E-01 | 4700 | 1.0E-04 |
| 410 | < 1.0E-05 | 710 | 9.8E-01 | 1010 | 9.5E-01 | 1750 | 9.7E-01 | 3250 | 2.3E-01 | 4750 | 4.9E-05 |
| 420 | < 1.0E-05 | 720 | 9.8E-01 | 1020 | 9.5E-01 | 1800 | 9.7E-01 | 3300 | 2.1E-01 | 4800 | 2.4E-05 |
| 430 | < 1.0E-05 | 730 | 9.8E-01 | 1030 | 9.5E-01 | 1850 | 9.7E-01 | 3350 | 1.9E-01 | 4850 | 1.1E-05 |
| 440 | < 1.0E-05 | 740 | 9.7E-01 | 1040 | 9.5E-01 | 1900 | 9.7E-01 | 3400 | 1.7E-01 | 4900 | < 1.0E-05 |
| 450 | < 1.0E-05 | 750 | 9.7E-01 | 1050 | 9.5E-01 | 1950 | 9.6E-01 | 3450 | 1.6E-01 | 4950 | < 1.0E-05 |
| 460 | < 1.0E-05 | 760 | 9.7E-01 | 1060 | 9.5E-01 | 2000 | 9.6E-01 | 3500 | 1.6E-01 | 5000 | < 1.0E-05 |
| 470 | < 1.0E-05 | 770 | 9.7E-01 | 1070 | 9.5E-01 | 2050 | 9.6E-01 | 3550 | 1.6E-01 | 5050 | < 1.0E-05 |
| 480 | < 1.0E-05 | 780 | 9.7E-01 | 1080 | 9.5E-01 | 2100 | 9.6E-01 | 3600 | 1.5E-01 | 5100 | < 1.0E-05 |
| 490 | < 1.0E-05 | 790 | 9.7E-01 | 1090 | 9.5E-01 | 2150 | 9.5E-01 | 3650 | 1.6E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## OG550

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 550 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 480 | |
| λp (τip = 0.93) [nm] | = | 620 | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 546 | Hg | 1.51 |
| 587.6 | He | 1.51 |
| 852.1 | Cs | 1.51 |
| 1014 | Hg | 1.50 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.56 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 507 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.9 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.0 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.12 |

| Notes |
|---|
| |
| Colloidally colored glass |
| |
| Long pass filter |

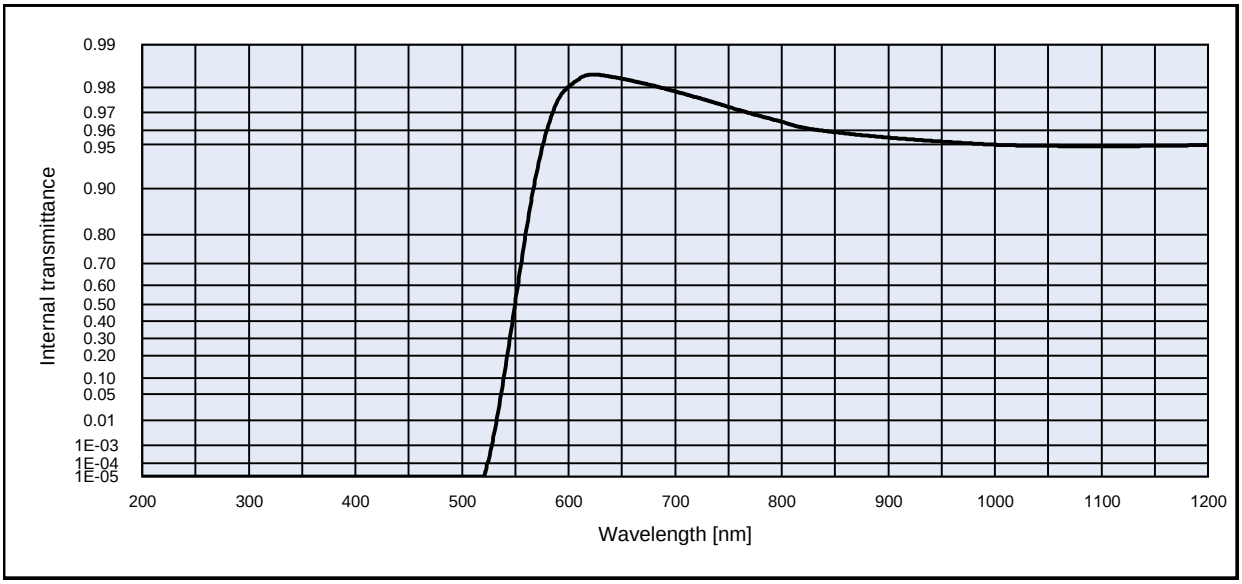
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

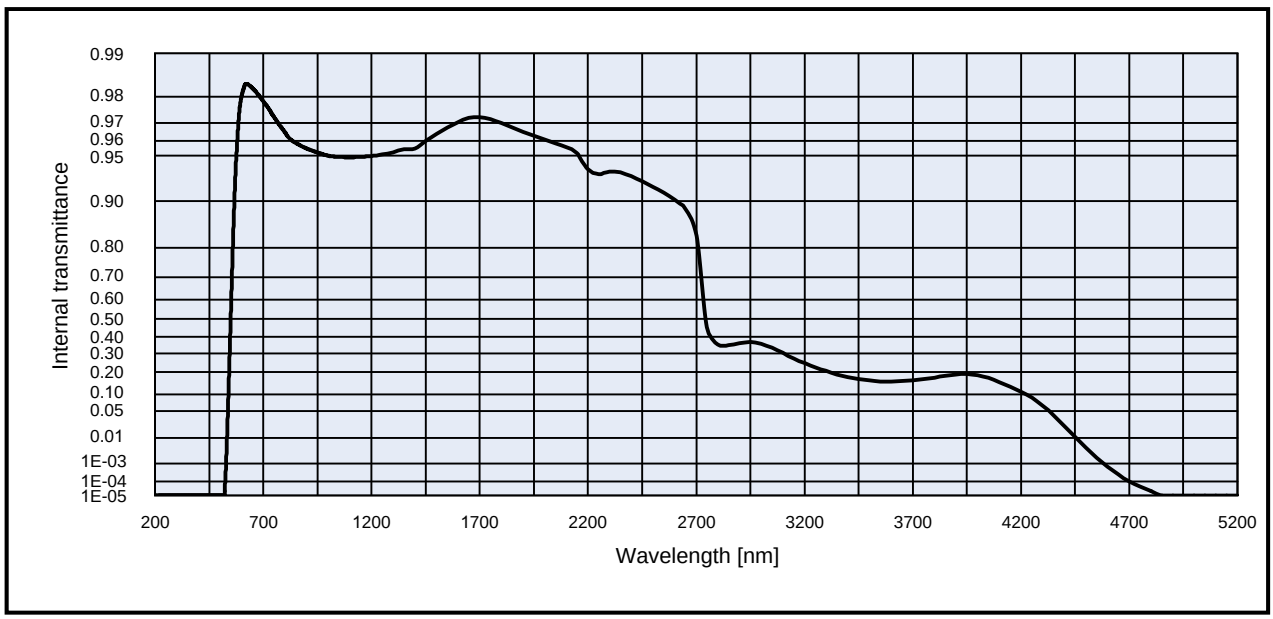
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.565 | 0.580 | 0.587 |
| y | 0.429 | 0.419 | 0.412 |
| Y | 70 | 65 | 62 |
| $\lambda_d$ [nm] | 589 | 591 | 592 |
| $P_e$ | 0.96 | 1.00 | 1.00 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.558 | 0.574 | 0.581 |
| y | 0.435 | 0.425 | 0.418 |
| Y | 68 | 63 | 59 |
| $\lambda_d$ [nm] | 588 | 590 | 591 |
| $P_e$ | 0.96 | 1.00 | 1.00 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.521 | 0.547 | 0.557 |
| y | 0.459 | 0.451 | 0.441 |
| Y | 58 | 52 | 49 |
| $\lambda_d$ [nm] | 583 | 586 | 587 |
| $P_e$ | 0.95 | 1.00 | 1.00 |



# OG550




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | < 1.0E-05 | 800 | 9.7E-01 | 1100 | 9.5E-01 | 2200 | 9.4E-01 | 3700 | 1.6E-01 |
| 210 | < 1.0E-05 | 510 | < 1.0E-05 | 810 | 9.6E-01 | 1110 | 9.5E-01 | 2250 | 9.3E-01 | 3750 | 1.7E-01 |
| 220 | < 1.0E-05 | 520 | < 1.0E-05 | 820 | 9.6E-01 | 1120 | 9.5E-01 | 2300 | 9.4E-01 | 3800 | 1.7E-01 |
| 230 | < 1.0E-05 | 530 | 2.8E-03 | 830 | 9.6E-01 | 1130 | 9.5E-01 | 2350 | 9.4E-01 | 3850 | 1.8E-01 |
| 240 | < 1.0E-05 | 540 | 1.2E-01 | 840 | 9.6E-01 | 1140 | 9.5E-01 | 2400 | 9.3E-01 | 3900 | 1.9E-01 |
| 250 | < 1.0E-05 | 550 | 5.1E-01 | 850 | 9.6E-01 | 1150 | 9.5E-01 | 2450 | 9.3E-01 | 3950 | 1.9E-01 |
| 260 | < 1.0E-05 | 560 | 8.1E-01 | 860 | 9.6E-01 | 1160 | 9.5E-01 | 2500 | 9.2E-01 | 4000 | 1.8E-01 |
| 270 | < 1.0E-05 | 570 | 9.2E-01 | 870 | 9.6E-01 | 1170 | 9.5E-01 | 2550 | 9.1E-01 | 4050 | 1.7E-01 |
| 280 | < 1.0E-05 | 580 | 9.6E-01 | 880 | 9.6E-01 | 1180 | 9.5E-01 | 2600 | 9.0E-01 | 4100 | 1.5E-01 |
| 290 | < 1.0E-05 | 590 | 9.8E-01 | 890 | 9.6E-01 | 1190 | 9.5E-01 | 2650 | 8.9E-01 | 4150 | 1.3E-01 |
| 300 | < 1.0E-05 | 600 | 9.8E-01 | 900 | 9.6E-01 | 1200 | 9.5E-01 | 2700 | 8.3E-01 | 4200 | 1.1E-01 |
| 310 | < 1.0E-05 | 610 | 9.8E-01 | 910 | 9.5E-01 | 1250 | 9.5E-01 | 2750 | 4.6E-01 | 4250 | 8.8E-02 |
| 320 | < 1.0E-05 | 620 | 9.8E-01 | 920 | 9.5E-01 | 1300 | 9.5E-01 | 2800 | 3.5E-01 | 4300 | 6.2E-02 |
| 330 | < 1.0E-05 | 630 | 9.8E-01 | 930 | 9.5E-01 | 1350 | 9.5E-01 | 2850 | 3.5E-01 | 4350 | 3.9E-02 |
| 340 | < 1.0E-05 | 640 | 9.8E-01 | 940 | 9.5E-01 | 1400 | 9.6E-01 | 2900 | 3.6E-01 | 4400 | 2.3E-02 |
| 350 | < 1.0E-05 | 650 | 9.8E-01 | 950 | 9.5E-01 | 1450 | 9.6E-01 | 2950 | 3.7E-01 | 4450 | 1.1E-02 |
| 360 | < 1.0E-05 | 660 | 9.8E-01 | 960 | 9.5E-01 | 1500 | 9.6E-01 | 3000 | 3.6E-01 | 4500 | 4.7E-03 |
| 370 | < 1.0E-05 | 670 | 9.8E-01 | 970 | 9.5E-01 | 1550 | 9.7E-01 | 3050 | 3.4E-01 | 4550 | 1.8E-03 |
| 380 | < 1.0E-05 | 680 | 9.8E-01 | 980 | 9.5E-01 | 1600 | 9.7E-01 | 3100 | 3.1E-01 | 4600 | 7.0E-04 |
| 390 | < 1.0E-05 | 690 | 9.8E-01 | 990 | 9.5E-01 | 1650 | 9.7E-01 | 3150 | 2.7E-01 | 4650 | 2.7E-04 |
| 400 | < 1.0E-05 | 700 | 9.8E-01 | 1000 | 9.5E-01 | 1700 | 9.7E-01 | 3200 | 2.5E-01 | 4700 | 1.0E-04 |
| 410 | < 1.0E-05 | 710 | 9.8E-01 | 1010 | 9.5E-01 | 1750 | 9.7E-01 | 3250 | 2.2E-01 | 4750 | 4.5E-05 |
| 420 | < 1.0E-05 | 720 | 9.8E-01 | 1020 | 9.5E-01 | 1800 | 9.7E-01 | 3300 | 2.1E-01 | 4800 | 2.3E-05 |
| 430 | < 1.0E-05 | 730 | 9.8E-01 | 1030 | 9.5E-01 | 1850 | 9.7E-01 | 3350 | 1.9E-01 | 4850 | 1.1E-05 |
| 440 | < 1.0E-05 | 740 | 9.7E-01 | 1040 | 9.5E-01 | 1900 | 9.7E-01 | 3400 | 1.7E-01 | 4900 | < 1.0E-05 |
| 450 | < 1.0E-05 | 750 | 9.7E-01 | 1050 | 9.5E-01 | 1950 | 9.6E-01 | 3450 | 1.7E-01 | 4950 | < 1.0E-05 |
| 460 | < 1.0E-05 | 760 | 9.7E-01 | 1060 | 9.5E-01 | 2000 | 9.6E-01 | 3500 | 1.6E-01 | 5000 | < 1.0E-05 |
| 470 | < 1.0E-05 | 770 | 9.7E-01 | 1070 | 9.5E-01 | 2050 | 9.6E-01 | 3550 | 1.5E-01 | 5050 | < 1.0E-05 |
| 480 | < 1.0E-05 | 780 | 9.7E-01 | 1080 | 9.5E-01 | 2100 | 9.6E-01 | 3600 | 1.5E-01 | 5100 | < 1.0E-05 |
| 490 | < 1.0E-05 | 790 | 9.7E-01 | 1090 | 9.5E-01 | 2150 | 9.5E-01 | 3650 | 1.6E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## OG570

| Density | |
|---|---|
| ρ [g/cm³] | 2.56 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 570 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 500 | |
| λp (τip = 0.93) [nm] | = | 640 | |

| Transformation temperature | |
|---|---|
| Tg [°C] | 510 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.9 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.0 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.51 |
| 852.1 | Cs | 1.51 |
| 1014 | Hg | 1.50 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.12 |

**Notes**

Colloidally colored glass

Long pass filter

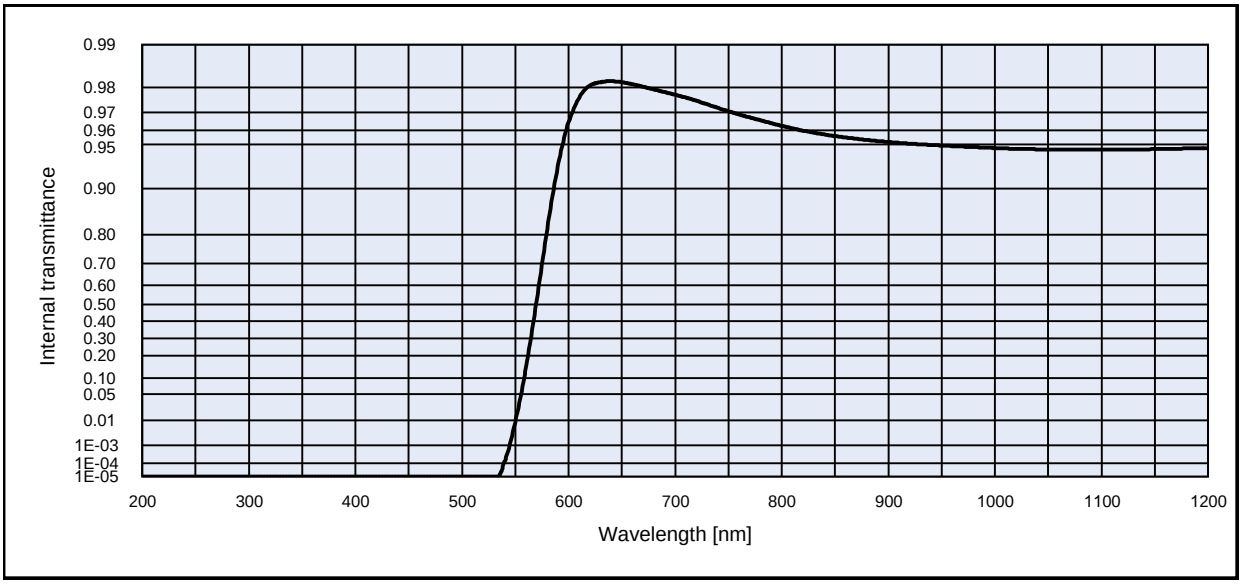
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.600 | 0.619 | 0.627 |
| y | 0.394 | 0.380 | 0.372 |
| Y | 56 | 49 | 46 |
| $\lambda_d$ [nm] | 596 | 598 | 600 |
| $P_e$ | 0.96 | 1.00 | 1.00 |

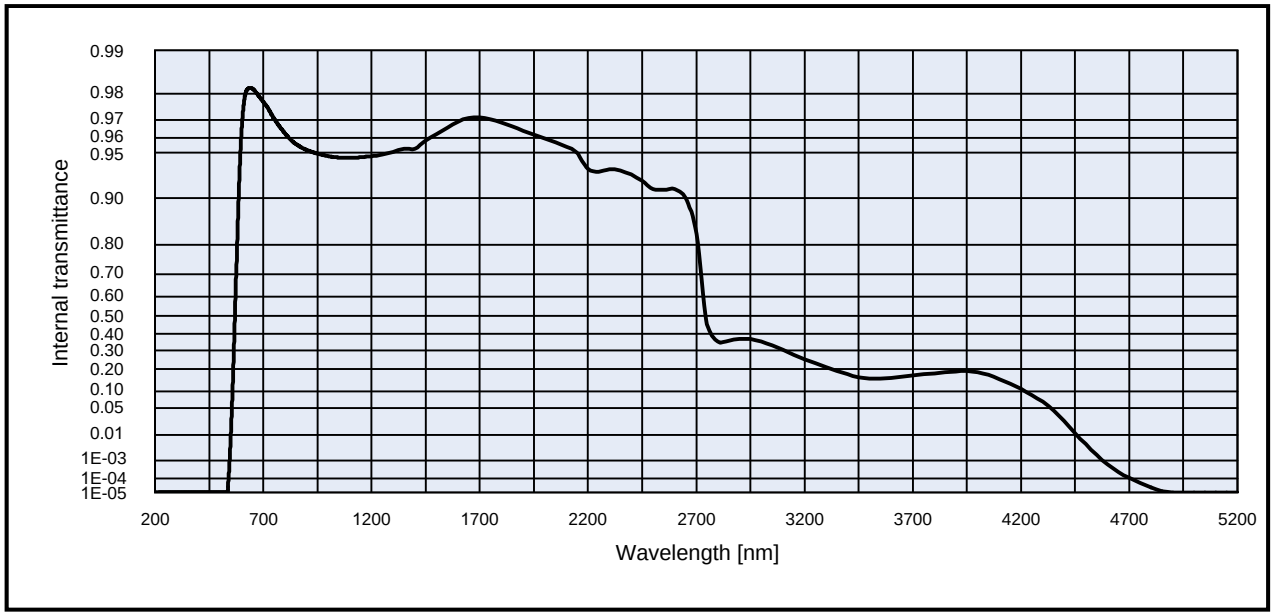
| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.595 | 0.616 | 0.624 |
| y | 0.398 | 0.384 | 0.375 |
| Y | 53 | 47 | 44 |
| $\lambda_d$ [nm] | 595 | 598 | 599 |
| $P_e$ | 0.96 | 1.00 | 1.00 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.566 | 0.600 | 0.611 |
| y | 0.412 | 0.399 | 0.389 |
| Y | 43 | 36 | 33 |
| $\lambda_d$ [nm] | 591 | 595 | 597 |
| $P_e$ | 0.94 | 1.00 | 1.00 |



# OG570

SCHOTT




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | < 1.0E-05 | 800 | 9.6E-01 | 1100 | 9.5E-01 | 2200 | 9.4E-01 | 3700 | 1.7E-01 |
| 210 | < 1.0E-05 | 510 | < 1.0E-05 | 810 | 9.6E-01 | 1110 | 9.5E-01 | 2250 | 9.3E-01 | 3750 | 1.7E-01 |
| 220 | < 1.0E-05 | 520 | < 1.0E-05 | 820 | 9.6E-01 | 1120 | 9.5E-01 | 2300 | 9.4E-01 | 3800 | 1.8E-01 |
| 230 | < 1.0E-05 | 530 | < 1.0E-05 | 830 | 9.6E-01 | 1130 | 9.5E-01 | 2350 | 9.3E-01 | 3850 | 1.8E-01 |
| 240 | < 1.0E-05 | 540 | 1.3E-04 | 840 | 9.6E-01 | 1140 | 9.5E-01 | 2400 | 9.3E-01 | 3900 | 1.9E-01 |
| 250 | < 1.0E-05 | 550 | 8.8E-03 | 850 | 9.6E-01 | 1150 | 9.5E-01 | 2450 | 9.2E-01 | 3950 | 1.9E-01 |
| 260 | < 1.0E-05 | 560 | 1.4E-01 | 860 | 9.6E-01 | 1160 | 9.5E-01 | 2500 | 9.1E-01 | 4000 | 1.8E-01 |
| 270 | < 1.0E-05 | 570 | 5.2E-01 | 870 | 9.5E-01 | 1170 | 9.5E-01 | 2550 | 9.1E-01 | 4050 | 1.7E-01 |
| 280 | < 1.0E-05 | 580 | 8.2E-01 | 880 | 9.5E-01 | 1180 | 9.5E-01 | 2600 | 9.1E-01 | 4100 | 1.5E-01 |
| 290 | < 1.0E-05 | 590 | 9.3E-01 | 890 | 9.5E-01 | 1190 | 9.5E-01 | 2650 | 9.0E-01 | 4150 | 1.3E-01 |
| 300 | < 1.0E-05 | 600 | 9.6E-01 | 900 | 9.5E-01 | 1200 | 9.5E-01 | 2700 | 8.3E-01 | 4200 | 1.1E-01 |
| 310 | < 1.0E-05 | 610 | 9.8E-01 | 910 | 9.5E-01 | 1250 | 9.5E-01 | 2750 | 4.6E-01 | 4250 | 8.8E-02 |
| 320 | < 1.0E-05 | 620 | 9.8E-01 | 920 | 9.5E-01 | 1300 | 9.5E-01 | 2800 | 3.5E-01 | 4300 | 6.6E-02 |
| 330 | < 1.0E-05 | 630 | 9.8E-01 | 930 | 9.5E-01 | 1350 | 9.5E-01 | 2850 | 3.6E-01 | 4350 | 4.4E-02 |
| 340 | < 1.0E-05 | 640 | 9.8E-01 | 940 | 9.5E-01 | 1400 | 9.5E-01 | 2900 | 3.7E-01 | 4400 | 2.5E-02 |
| 350 | < 1.0E-05 | 650 | 9.8E-01 | 950 | 9.5E-01 | 1450 | 9.6E-01 | 2950 | 3.7E-01 | 4450 | 1.1E-02 |
| 360 | < 1.0E-05 | 660 | 9.8E-01 | 960 | 9.5E-01 | 1500 | 9.6E-01 | 3000 | 3.5E-01 | 4500 | 4.9E-03 |
| 370 | < 1.0E-05 | 670 | 9.8E-01 | 970 | 9.5E-01 | 1550 | 9.7E-01 | 3050 | 3.3E-01 | 4550 | 1.9E-03 |
| 380 | < 1.0E-05 | 680 | 9.8E-01 | 980 | 9.5E-01 | 1600 | 9.7E-01 | 3100 | 3.1E-01 | 4600 | 6.6E-04 |
| 390 | < 1.0E-05 | 690 | 9.8E-01 | 990 | 9.5E-01 | 1650 | 9.7E-01 | 3150 | 2.8E-01 | 4650 | 2.5E-04 |
| 400 | < 1.0E-05 | 700 | 9.8E-01 | 1000 | 9.5E-01 | 1700 | 9.7E-01 | 3200 | 2.5E-01 | 4700 | 1.1E-04 |
| 410 | < 1.0E-05 | 710 | 9.8E-01 | 1010 | 9.5E-01 | 1750 | 9.7E-01 | 3250 | 2.3E-01 | 4750 | 5.3E-05 |
| 420 | < 1.0E-05 | 720 | 9.8E-01 | 1020 | 9.5E-01 | 1800 | 9.7E-01 | 3300 | 2.1E-01 | 4800 | 2.5E-05 |
| 430 | < 1.0E-05 | 730 | 9.7E-01 | 1030 | 9.5E-01 | 1850 | 9.7E-01 | 3350 | 1.9E-01 | 4850 | 1.2E-05 |
| 440 | < 1.0E-05 | 740 | 9.7E-01 | 1040 | 9.5E-01 | 1900 | 9.6E-01 | 3400 | 1.7E-01 | 4900 | < 1.0E-05 |
| 450 | < 1.0E-05 | 750 | 9.7E-01 | 1050 | 9.5E-01 | 1950 | 9.6E-01 | 3450 | 1.6E-01 | 4950 | < 1.0E-05 |
| 460 | < 1.0E-05 | 760 | 9.7E-01 | 1060 | 9.5E-01 | 2000 | 9.6E-01 | 3500 | 1.5E-01 | 5000 | < 1.0E-05 |
| 470 | < 1.0E-05 | 770 | 9.7E-01 | 1070 | 9.5E-01 | 2050 | 9.6E-01 | 3550 | 1.5E-01 | 5050 | < 1.0E-05 |
| 480 | < 1.0E-05 | 780 | 9.7E-01 | 1080 | 9.5E-01 | 2100 | 9.5E-01 | 3600 | 1.6E-01 | 5100 | < 1.0E-05 |
| 490 | < 1.0E-05 | 790 | 9.6E-01 | 1090 | 9.5E-01 | 2150 | 9.5E-01 | 3650 | 1.6E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## OG590

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 590 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 510 | |
| λp (τip = 0.93) [nm] | = | 660 | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.51 |
| 852.1 | Cs | 1.51 |
| 1014 | Hg | 1.50 |

| Density | |
|---|---|
| ρ [g/cm³] | 2.56 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 506 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.9 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.0 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.13 |

| Notes |
|---|
| |
| Colloidally colored glass |
| |
| Long pass filter |

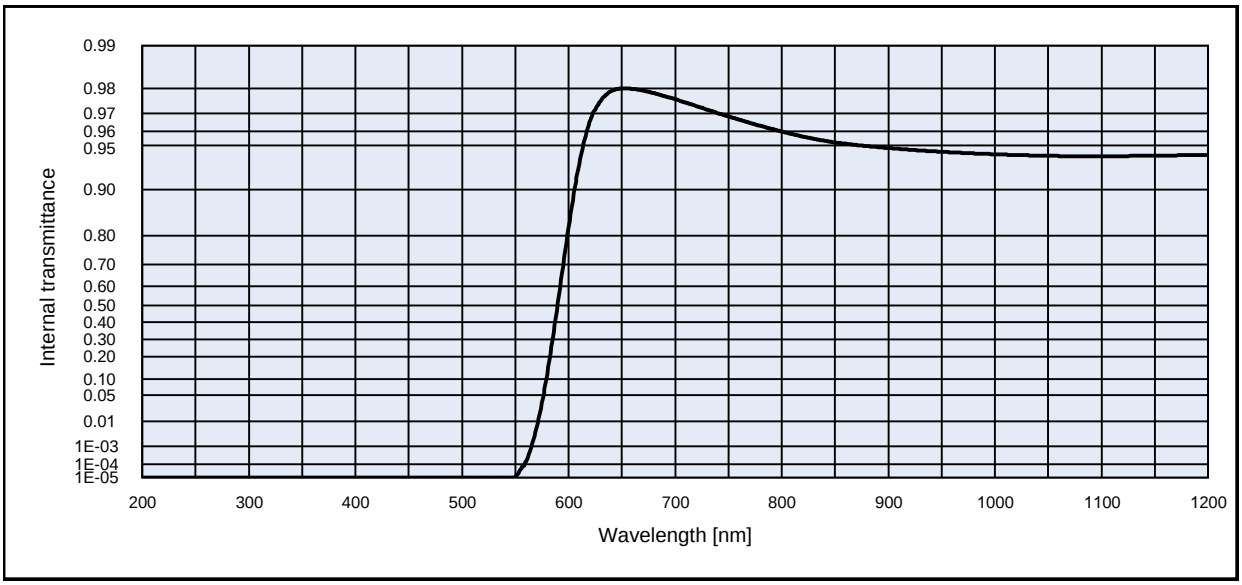
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

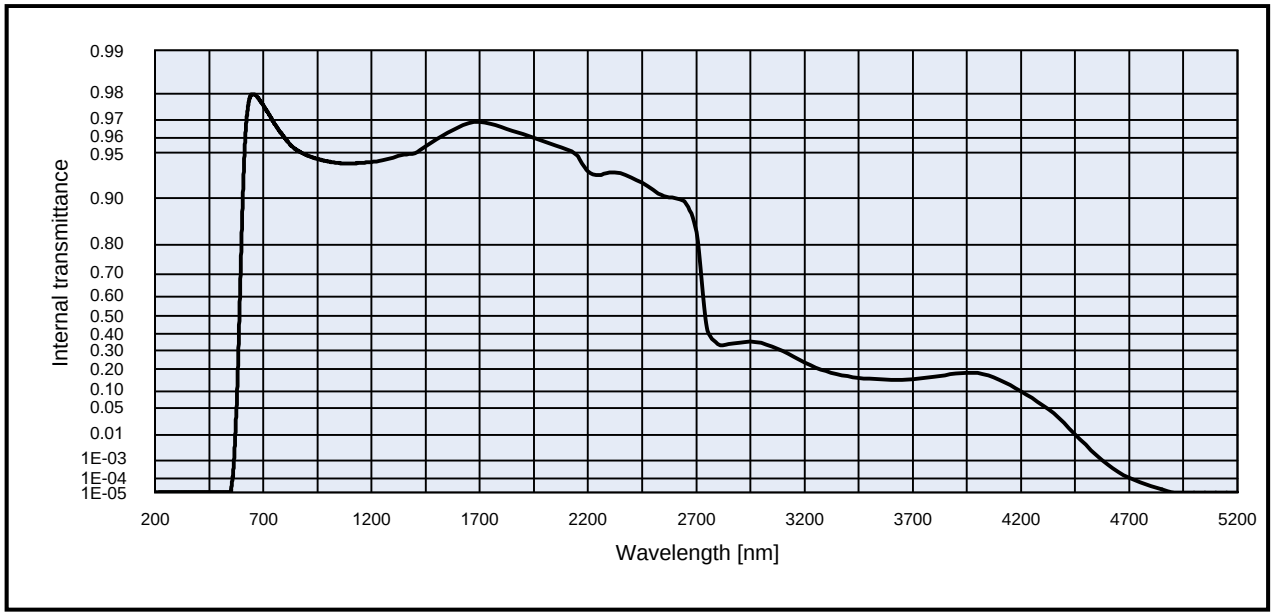
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.639 | 0.662 | 0.669 |
| y | 0.354 | 0.338 | 0.331 |
| Y | 39 | 33 | 30 |
| $\lambda_d$ [nm] | 605 | 609 | 611 |
| $P_e$ | 0.96 | 1.00 | 1.00 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.635 | 0.660 | 0.667 |
| y | 0.356 | 0.340 | 0.332 |
| Y | 37 | 31 | 28 |
| $\lambda_d$ [nm] | 604 | 608 | 611 |
| $P_e$ | 0.95 | 1.00 | 1.00 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.610 | 0.652 | 0.661 |
| y | 0.361 | 0.347 | 0.338 |
| Y | 27 | 22 | 19 |
| $\lambda_d$ [nm] | 602 | 606 | 609 |
| $P_e$ | 0.92 | 1.00 | 1.00 |



# OG590




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | < 1.0E-05 | 800 | 9.6E-01 | 1100 | 9.4E-01 | 2200 | 9.3E-01 | 3700 | 1.5E-01 |
| 210 | < 1.0E-05 | 510 | < 1.0E-05 | 810 | 9.6E-01 | 1110 | 9.4E-01 | 2250 | 9.3E-01 | 3750 | 1.6E-01 |
| 220 | < 1.0E-05 | 520 | < 1.0E-05 | 820 | 9.6E-01 | 1120 | 9.4E-01 | 2300 | 9.3E-01 | 3800 | 1.6E-01 |
| 230 | < 1.0E-05 | 530 | < 1.0E-05 | 830 | 9.6E-01 | 1130 | 9.4E-01 | 2350 | 9.3E-01 | 3850 | 1.7E-01 |
| 240 | < 1.0E-05 | 540 | < 1.0E-05 | 840 | 9.5E-01 | 1140 | 9.4E-01 | 2400 | 9.3E-01 | 3900 | 1.8E-01 |
| 250 | < 1.0E-05 | 550 | 1.1E-05 | 850 | 9.5E-01 | 1150 | 9.4E-01 | 2450 | 9.2E-01 | 3950 | 1.8E-01 |
| 260 | < 1.0E-05 | 560 | 1.3E-04 | 860 | 9.5E-01 | 1160 | 9.4E-01 | 2500 | 9.1E-01 | 4000 | 1.8E-01 |
| 270 | < 1.0E-05 | 570 | 5.9E-03 | 870 | 9.5E-01 | 1170 | 9.4E-01 | 2550 | 9.0E-01 | 4050 | 1.7E-01 |
| 280 | < 1.0E-05 | 580 | 1.2E-01 | 880 | 9.5E-01 | 1180 | 9.4E-01 | 2600 | 9.0E-01 | 4100 | 1.5E-01 |
| 290 | < 1.0E-05 | 590 | 5.2E-01 | 890 | 9.5E-01 | 1190 | 9.4E-01 | 2650 | 8.9E-01 | 4150 | 1.2E-01 |
| 300 | < 1.0E-05 | 600 | 8.2E-01 | 900 | 9.5E-01 | 1200 | 9.4E-01 | 2700 | 8.3E-01 | 4200 | 1.0E-01 |
| 310 | < 1.0E-05 | 610 | 9.3E-01 | 910 | 9.5E-01 | 1250 | 9.4E-01 | 2750 | 4.3E-01 | 4250 | 7.8E-02 |
| 320 | < 1.0E-05 | 620 | 9.7E-01 | 920 | 9.5E-01 | 1300 | 9.5E-01 | 2800 | 3.4E-01 | 4300 | 5.7E-02 |
| 330 | < 1.0E-05 | 630 | 9.8E-01 | 930 | 9.5E-01 | 1350 | 9.5E-01 | 2850 | 3.4E-01 | 4350 | 3.9E-02 |
| 340 | < 1.0E-05 | 640 | 9.8E-01 | 940 | 9.5E-01 | 1400 | 9.5E-01 | 2900 | 3.5E-01 | 4400 | 2.2E-02 |
| 350 | < 1.0E-05 | 650 | 9.8E-01 | 950 | 9.4E-01 | 1450 | 9.5E-01 | 2950 | 3.5E-01 | 4450 | 1.0E-02 |
| 360 | < 1.0E-05 | 660 | 9.8E-01 | 960 | 9.4E-01 | 1500 | 9.6E-01 | 3000 | 3.5E-01 | 4500 | 4.7E-03 |
| 370 | < 1.0E-05 | 670 | 9.8E-01 | 970 | 9.4E-01 | 1550 | 9.6E-01 | 3050 | 3.3E-01 | 4550 | 1.7E-03 |
| 380 | < 1.0E-05 | 680 | 9.8E-01 | 980 | 9.4E-01 | 1600 | 9.7E-01 | 3100 | 3.0E-01 | 4600 | 6.6E-04 |
| 390 | < 1.0E-05 | 690 | 9.8E-01 | 990 | 9.4E-01 | 1650 | 9.7E-01 | 3150 | 2.6E-01 | 4650 | 2.5E-04 |
| 400 | < 1.0E-05 | 700 | 9.8E-01 | 1000 | 9.4E-01 | 1700 | 9.7E-01 | 3200 | 2.3E-01 | 4700 | 1.1E-04 |
| 410 | < 1.0E-05 | 710 | 9.7E-01 | 1010 | 9.4E-01 | 1750 | 9.7E-01 | 3250 | 2.1E-01 | 4750 | 5.7E-05 |
| 420 | < 1.0E-05 | 720 | 9.7E-01 | 1020 | 9.4E-01 | 1800 | 9.7E-01 | 3300 | 1.9E-01 | 4800 | 3.2E-05 |
| 430 | < 1.0E-05 | 730 | 9.7E-01 | 1030 | 9.4E-01 | 1850 | 9.6E-01 | 3350 | 1.8E-01 | 4850 | 1.8E-05 |
| 440 | < 1.0E-05 | 740 | 9.7E-01 | 1040 | 9.4E-01 | 1900 | 9.6E-01 | 3400 | 1.6E-01 | 4900 | < 1.0E-05 |
| 450 | < 1.0E-05 | 750 | 9.7E-01 | 1050 | 9.4E-01 | 1950 | 9.6E-01 | 3450 | 1.6E-01 | 4950 | < 1.0E-05 |
| 460 | < 1.0E-05 | 760 | 9.7E-01 | 1060 | 9.4E-01 | 2000 | 9.6E-01 | 3500 | 1.5E-01 | 5000 | < 1.0E-05 |
| 470 | < 1.0E-05 | 770 | 9.7E-01 | 1070 | 9.4E-01 | 2050 | 9.5E-01 | 3550 | 1.5E-01 | 5050 | < 1.0E-05 |
| 480 | < 1.0E-05 | 780 | 9.6E-01 | 1080 | 9.4E-01 | 2100 | 9.5E-01 | 3600 | 1.5E-01 | 5100 | < 1.0E-05 |
| 490 | < 1.0E-05 | 790 | 9.6E-01 | 1090 | 9.4E-01 | 2150 | 9.5E-01 | 3650 | 1.5E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## RG9

| Density | |
|---|---|
| ρ [g/cm³] | 2.58 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (720 nm) | ≤ | 0.45 |
| τi (800 nm) | ≥ | 0.92 |
| τi (1060 nm) | ≤ | 0.40 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 519 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.9 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.0 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.52 |
| 852.1 | Cs | 1.51 |
| 1014 | Hg | 1.50 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.06 |

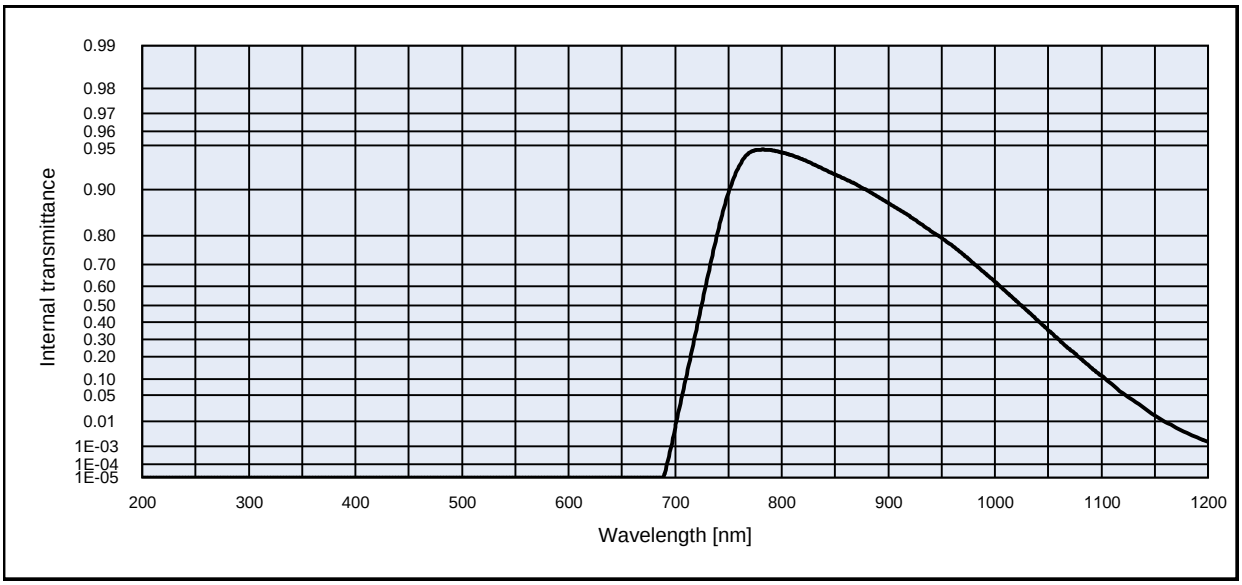
| Notes |
|---|
| |
| Ionically / Colloidally colored glass |
| |
| Band pass filter / long pass filter |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

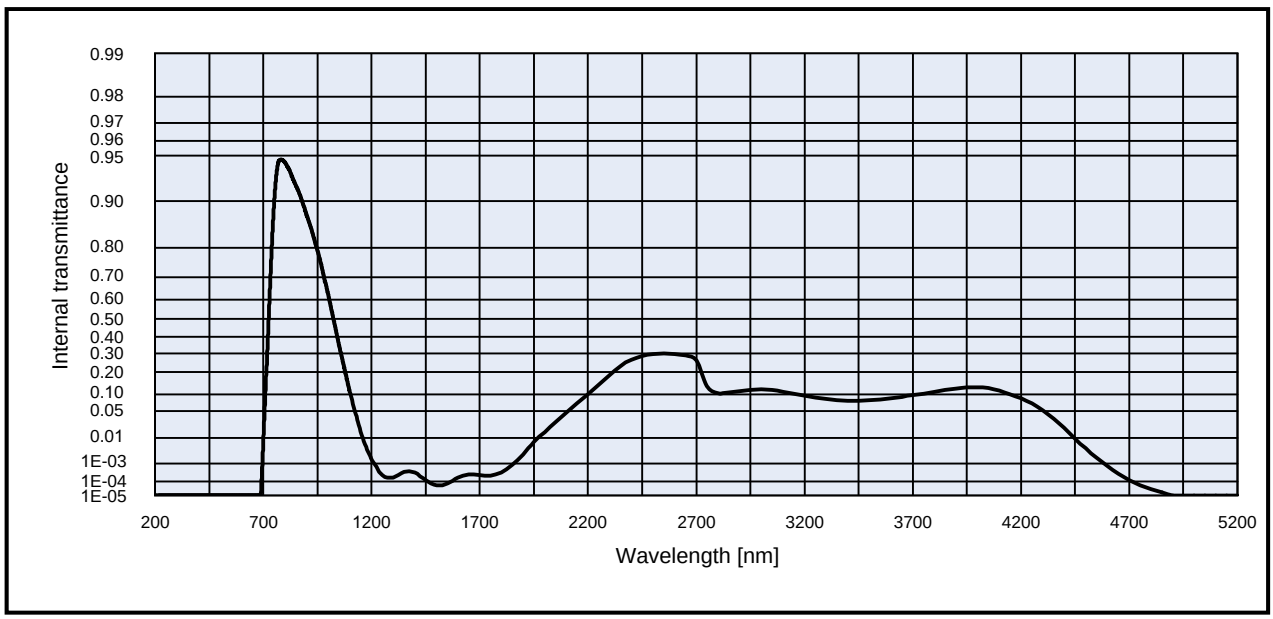
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# RG9




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | < 1.0E-05 | 800 | 9.4E-01 | 1100 | 1.1E-01 | 2200 | 1.0E-01 | 3700 | 9.7E-02 |
| 210 | < 1.0E-05 | 510 | < 1.0E-05 | 810 | 9.4E-01 | 1110 | 8.1E-02 | 2250 | 1.4E-01 | 3750 | 1.0E-01 |
| 220 | < 1.0E-05 | 520 | < 1.0E-05 | 820 | 9.4E-01 | 1120 | 5.6E-02 | 2300 | 1.8E-01 | 3800 | 1.1E-01 |
| 230 | < 1.0E-05 | 530 | < 1.0E-05 | 830 | 9.3E-01 | 1130 | 3.9E-02 | 2350 | 2.3E-01 | 3850 | 1.2E-01 |
| 240 | < 1.0E-05 | 540 | < 1.0E-05 | 840 | 9.3E-01 | 1140 | 2.5E-02 | 2400 | 2.6E-01 | 3900 | 1.2E-01 |
| 250 | < 1.0E-05 | 550 | < 1.0E-05 | 850 | 9.2E-01 | 1150 | 1.6E-02 | 2450 | 2.9E-01 | 3950 | 1.3E-01 |
| 260 | < 1.0E-05 | 560 | < 1.0E-05 | 860 | 9.1E-01 | 1160 | 9.6E-03 | 2500 | 3.0E-01 | 4000 | 1.3E-01 |
| 270 | < 1.0E-05 | 570 | < 1.0E-05 | 870 | 9.1E-01 | 1170 | 6.1E-03 | 2550 | 3.0E-01 | 4050 | 1.3E-01 |
| 280 | < 1.0E-05 | 580 | < 1.0E-05 | 880 | 9.0E-01 | 1180 | 3.9E-03 | 2600 | 3.0E-01 | 4100 | 1.1E-01 |
| 290 | < 1.0E-05 | 590 | < 1.0E-05 | 890 | 8.9E-01 | 1190 | 2.5E-03 | 2650 | 2.9E-01 | 4150 | 1.0E-01 |
| 300 | < 1.0E-05 | 600 | < 1.0E-05 | 900 | 8.8E-01 | 1200 | 1.6E-03 | 2700 | 2.6E-01 | 4200 | 8.6E-02 |
| 310 | < 1.0E-05 | 610 | < 1.0E-05 | 910 | 8.7E-01 | 1250 | 2.5E-04 | 2750 | 1.3E-01 | 4250 | 7.0E-02 |
| 320 | < 1.0E-05 | 620 | < 1.0E-05 | 920 | 8.5E-01 | 1300 | 1.8E-04 | 2800 | 1.0E-01 | 4300 | 5.2E-02 |
| 330 | < 1.0E-05 | 630 | < 1.0E-05 | 930 | 8.3E-01 | 1350 | 3.7E-04 | 2850 | 1.1E-01 | 4350 | 3.4E-02 |
| 340 | < 1.0E-05 | 640 | < 1.0E-05 | 940 | 8.1E-01 | 1400 | 3.4E-04 | 2900 | 1.1E-01 | 4400 | 2.0E-02 |
| 350 | < 1.0E-05 | 650 | < 1.0E-05 | 950 | 7.9E-01 | 1450 | 1.3E-04 | 2950 | 1.2E-01 | 4450 | 9.8E-03 |
| 360 | < 1.0E-05 | 660 | < 1.0E-05 | 960 | 7.7E-01 | 1500 | 5.7E-05 | 3000 | 1.2E-01 | 4500 | 4.4E-03 |
| 370 | < 1.0E-05 | 670 | < 1.0E-05 | 970 | 7.4E-01 | 1550 | 7.8E-05 | 3050 | 1.2E-01 | 4550 | 1.8E-03 |
| 380 | < 1.0E-05 | 680 | < 1.0E-05 | 980 | 7.1E-01 | 1600 | 1.7E-04 | 3100 | 1.1E-01 | 4600 | 7.2E-04 |
| 390 | < 1.0E-05 | 690 | 1.9E-05 | 990 | 6.7E-01 | 1650 | 2.7E-04 | 3150 | 1.0E-01 | 4650 | 2.8E-04 |
| 400 | < 1.0E-05 | 700 | 6.4E-03 | 1000 | 6.2E-01 | 1700 | 2.4E-04 | 3200 | 9.5E-02 | 4700 | 1.2E-04 |
| 410 | < 1.0E-05 | 710 | 9.9E-02 | 1010 | 5.8E-01 | 1750 | 2.2E-04 | 3250 | 8.9E-02 | 4750 | 5.8E-05 |
| 420 | < 1.0E-05 | 720 | 3.6E-01 | 1020 | 5.2E-01 | 1800 | 3.3E-04 | 3300 | 8.4E-02 | 4800 | 3.2E-05 |
| 430 | < 1.0E-05 | 730 | 6.3E-01 | 1030 | 4.7E-01 | 1850 | 8.6E-04 | 3350 | 8.0E-02 | 4850 | 1.7E-05 |
| 440 | < 1.0E-05 | 740 | 8.1E-01 | 1040 | 4.1E-01 | 1900 | 2.5E-03 | 3400 | 7.7E-02 | 4900 | < 1.0E-05 |
| 450 | < 1.0E-05 | 750 | 9.0E-01 | 1050 | 3.5E-01 | 1950 | 7.4E-03 | 3450 | 7.8E-02 | 4950 | < 1.0E-05 |
| 460 | < 1.0E-05 | 760 | 9.3E-01 | 1060 | 3.0E-01 | 2000 | 1.5E-02 | 3500 | 7.9E-02 | 5000 | < 1.0E-05 |
| 470 | < 1.0E-05 | 770 | 9.4E-01 | 1070 | 2.4E-01 | 2050 | 2.8E-02 | 3550 | 8.2E-02 | 5050 | < 1.0E-05 |
| 480 | < 1.0E-05 | 780 | 9.5E-01 | 1080 | 1.9E-01 | 2100 | 4.6E-02 | 3600 | 8.7E-02 | 5100 | < 1.0E-05 |
| 490 | < 1.0E-05 | 790 | 9.5E-01 | 1090 | 1.5E-01 | 2150 | 7.0E-02 | 3650 | 9.2E-02 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## RG610

| Density | |
|---|---|
| ρ [g/cm³] | 2.65 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 610 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 530 | |
| λp (τip = 0.94) [nm] | = | 690 | |

| Transformation temperature | |
|---|---|
| Tg [°C] | 520 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 8.0 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.2 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.52 |
| 852.1 | Cs | 1.52 |
| 1014 | Hg | 1.51 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.14 |

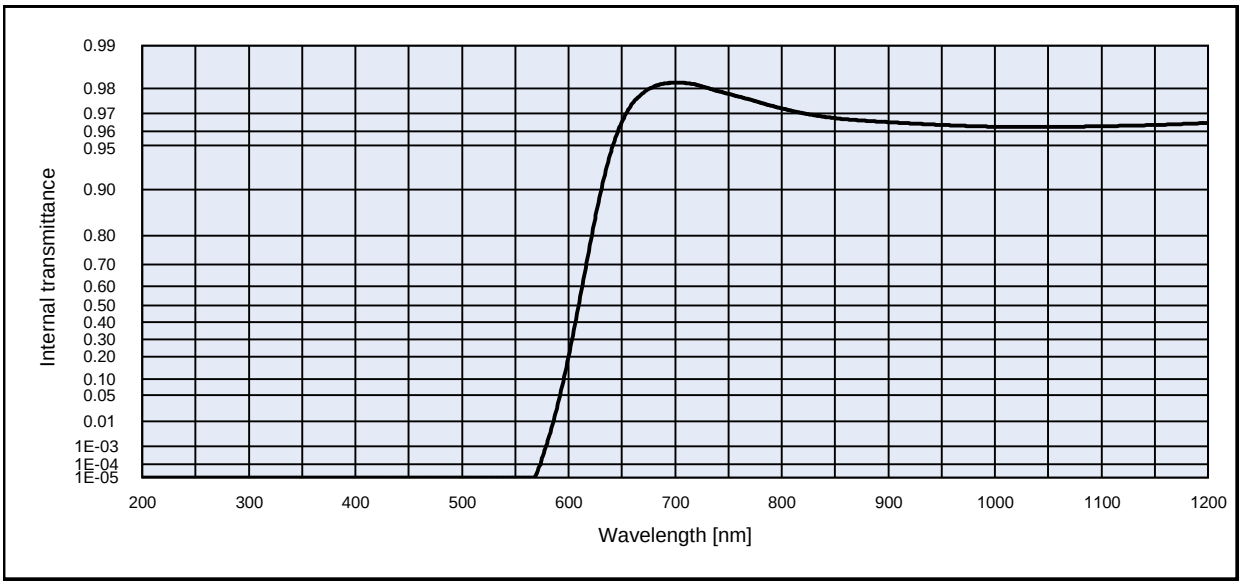
| Notes |
|---|
| |
| Colloidally colored glass |
| |
| Long pass filter |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

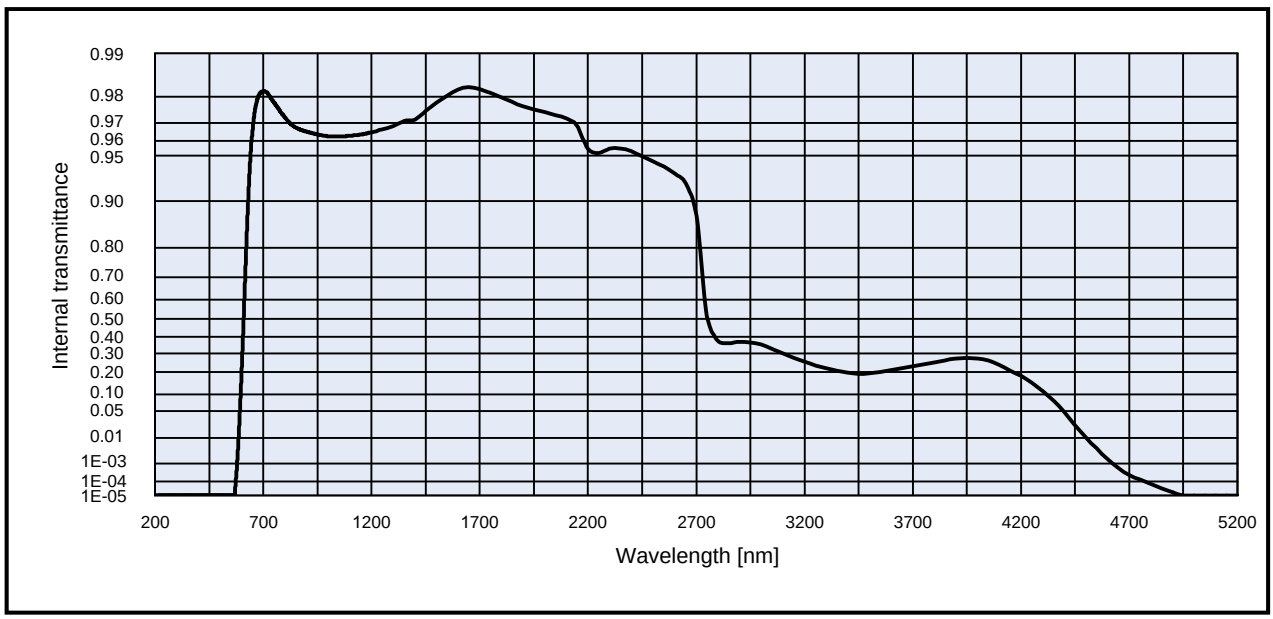
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.663 | 0.690 | 0.697 |
| y | 0.328 | 0.310 | 0.303 |
| Y | 27 | 20 | 17 |
| $\lambda_d$ [nm] | 614 | 619 | 623 |
| $P_e$ | 0.94 | 1.00 | 1.00 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.659 | 0.689 | 0.696 |
| y | 0.329 | 0.311 | 0.304 |
| Y | 25 | 18 | 15 |
| $\lambda_d$ [nm] | 613 | 619 | 623 |
| $P_e$ | 0.93 | 1.00 | 1.00 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.629 | 0.684 | 0.693 |
| y | 0.330 | 0.315 | 0.307 |
| Y | 17 | 12 | 10 |
| $\lambda_d$ [nm] | 611 | 617 | 621 |
| $P_e$ | 0.89 | 1.00 | 1.00 |



# RG610




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | < 1.0E-05 | 800 | 9.7E-01 | 1100 | 9.6E-01 | 2200 | 9.5E-01 | 3700 | 2.3E-01 |
| 210 | < 1.0E-05 | 510 | < 1.0E-05 | 810 | 9.7E-01 | 1110 | 9.6E-01 | 2250 | 9.5E-01 | 3750 | 2.4E-01 |
| 220 | < 1.0E-05 | 520 | < 1.0E-05 | 820 | 9.7E-01 | 1120 | 9.6E-01 | 2300 | 9.6E-01 | 3800 | 2.5E-01 |
| 230 | < 1.0E-05 | 530 | < 1.0E-05 | 830 | 9.7E-01 | 1130 | 9.6E-01 | 2350 | 9.6E-01 | 3850 | 2.6E-01 |
| 240 | < 1.0E-05 | 540 | < 1.0E-05 | 840 | 9.7E-01 | 1140 | 9.6E-01 | 2400 | 9.5E-01 | 3900 | 2.7E-01 |
| 250 | < 1.0E-05 | 550 | < 1.0E-05 | 850 | 9.7E-01 | 1150 | 9.6E-01 | 2450 | 9.5E-01 | 3950 | 2.8E-01 |
| 260 | < 1.0E-05 | 560 | < 1.0E-05 | 860 | 9.7E-01 | 1160 | 9.6E-01 | 2500 | 9.5E-01 | 4000 | 2.7E-01 |
| 270 | < 1.0E-05 | 570 | 2.1E-05 | 870 | 9.7E-01 | 1170 | 9.6E-01 | 2550 | 9.4E-01 | 4050 | 2.6E-01 |
| 280 | < 1.0E-05 | 580 | 1.5E-03 | 880 | 9.7E-01 | 1180 | 9.6E-01 | 2600 | 9.3E-01 | 4100 | 2.4E-01 |
| 290 | < 1.0E-05 | 590 | 3.1E-02 | 890 | 9.7E-01 | 1190 | 9.6E-01 | 2650 | 9.2E-01 | 4150 | 2.1E-01 |
| 300 | < 1.0E-05 | 600 | 2.0E-01 | 900 | 9.7E-01 | 1200 | 9.7E-01 | 2700 | 8.7E-01 | 4200 | 1.8E-01 |
| 310 | < 1.0E-05 | 610 | 5.2E-01 | 910 | 9.7E-01 | 1250 | 9.7E-01 | 2750 | 5.2E-01 | 4250 | 1.5E-01 |
| 320 | < 1.0E-05 | 620 | 7.7E-01 | 920 | 9.6E-01 | 1300 | 9.7E-01 | 2800 | 3.7E-01 | 4300 | 1.1E-01 |
| 330 | < 1.0E-05 | 630 | 8.9E-01 | 930 | 9.6E-01 | 1350 | 9.7E-01 | 2850 | 3.6E-01 | 4350 | 7.8E-02 |
| 340 | < 1.0E-05 | 640 | 9.5E-01 | 940 | 9.6E-01 | 1400 | 9.7E-01 | 2900 | 3.7E-01 | 4400 | 4.8E-02 |
| 350 | < 1.0E-05 | 650 | 9.7E-01 | 950 | 9.6E-01 | 1450 | 9.8E-01 | 2950 | 3.7E-01 | 4450 | 2.4E-02 |
| 360 | < 1.0E-05 | 660 | 9.7E-01 | 960 | 9.6E-01 | 1500 | 9.8E-01 | 3000 | 3.5E-01 | 4500 | 1.1E-02 |
| 370 | < 1.0E-05 | 670 | 9.8E-01 | 970 | 9.6E-01 | 1550 | 9.8E-01 | 3050 | 3.3E-01 | 4550 | 4.5E-03 |
| 380 | < 1.0E-05 | 680 | 9.8E-01 | 980 | 9.6E-01 | 1600 | 9.8E-01 | 3100 | 3.0E-01 | 4600 | 1.6E-03 |
| 390 | < 1.0E-05 | 690 | 9.8E-01 | 990 | 9.6E-01 | 1650 | 9.8E-01 | 3150 | 2.8E-01 | 4650 | 5.7E-04 |
| 400 | < 1.0E-05 | 700 | 9.8E-01 | 1000 | 9.6E-01 | 1700 | 9.8E-01 | 3200 | 2.5E-01 | 4700 | 2.5E-04 |
| 410 | < 1.0E-05 | 710 | 9.8E-01 | 1010 | 9.6E-01 | 1750 | 9.8E-01 | 3250 | 2.3E-01 | 4750 | 1.3E-04 |
| 420 | < 1.0E-05 | 720 | 9.8E-01 | 1020 | 9.6E-01 | 1800 | 9.8E-01 | 3300 | 2.2E-01 | 4800 | 6.7E-05 |
| 430 | < 1.0E-05 | 730 | 9.8E-01 | 1030 | 9.6E-01 | 1850 | 9.8E-01 | 3350 | 2.1E-01 | 4850 | 3.4E-05 |
| 440 | < 1.0E-05 | 740 | 9.8E-01 | 1040 | 9.6E-01 | 1900 | 9.8E-01 | 3400 | 2.0E-01 | 4900 | 1.7E-05 |
| 450 | < 1.0E-05 | 750 | 9.8E-01 | 1050 | 9.6E-01 | 1950 | 9.8E-01 | 3450 | 1.9E-01 | 4950 | < 1.0E-05 |
| 460 | < 1.0E-05 | 760 | 9.8E-01 | 1060 | 9.6E-01 | 2000 | 9.7E-01 | 3500 | 1.9E-01 | 5000 | < 1.0E-05 |
| 470 | < 1.0E-05 | 770 | 9.8E-01 | 1070 | 9.6E-01 | 2050 | 9.7E-01 | 3550 | 2.0E-01 | 5050 | < 1.0E-05 |
| 480 | < 1.0E-05 | 780 | 9.7E-01 | 1080 | 9.6E-01 | 2100 | 9.7E-01 | 3600 | 2.1E-01 | 5100 | < 1.0E-05 |
| 490 | < 1.0E-05 | 790 | 9.7E-01 | 1090 | 9.6E-01 | 2150 | 9.7E-01 | 3650 | 2.2E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

# RG630

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 630 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 540 | |
| λp (τip = 0.94) [nm] | = | 710 | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.52 |
| 852.1 | Cs | 1.52 |
| 1014 | Hg | 1.51 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.65 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 527 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 8.0 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.2 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.14 |

| Notes |
|---|
| |
| Colloidally colored glass |
| |
| Long pass filter |

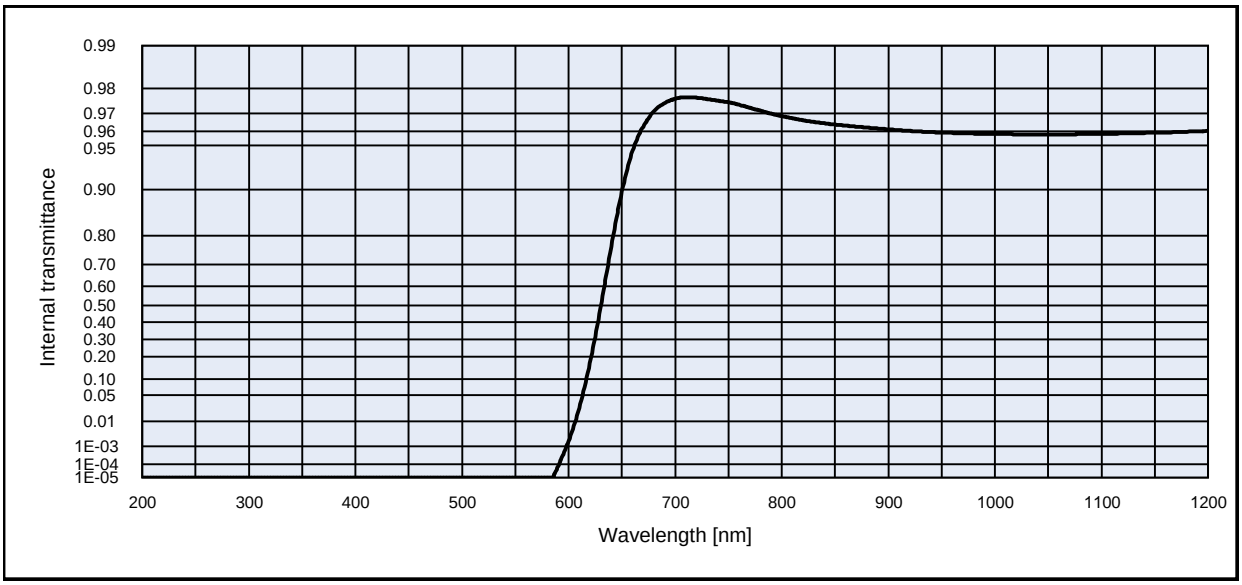
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

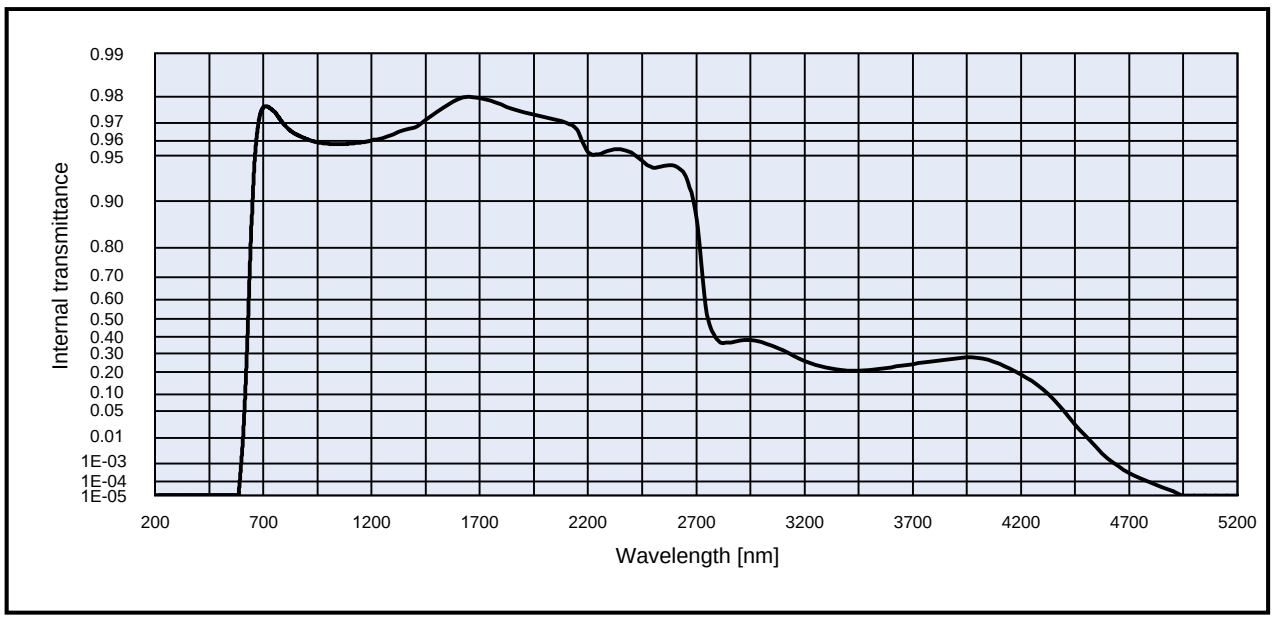
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.678 | 0.712 | 0.718 |
| y | 0.307 | 0.287 | 0.282 |
| Y | 15 | 9 | 8 |
| $\lambda_d$ [nm] | 627 | 634 | 639 |
| $P_e$ | 0.90 | 1.00 | 1.00 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.672 | 0.712 | 0.717 |
| y | 0.308 | 0.287 | 0.283 |
| Y | 14 | 8 | 7 |
| $\lambda_d$ [nm] | 627 | 634 | 638 |
| $P_e$ | 0.89 | 1.00 | 1.00 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.624 | 0.708 | 0.716 |
| y | 0.305 | 0.289 | 0.284 |
| Y | 9 | 5 | 4 |
| $\lambda_d$ [nm] | 625 | 633 | 637 |
| $P_e$ | 0.80 | 0.99 | 1.00 |



# RG630




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | < 1.0E-05 | 800 | 9.7E-01 | 1100 | 9.6E-01 | 2200 | 9.5E-01 | 3700 | 2.4E-01 |
| 210 | < 1.0E-05 | 510 | < 1.0E-05 | 810 | 9.7E-01 | 1110 | 9.6E-01 | 2250 | 9.5E-01 | 3750 | 2.5E-01 |
| 220 | < 1.0E-05 | 520 | < 1.0E-05 | 820 | 9.7E-01 | 1120 | 9.6E-01 | 2300 | 9.5E-01 | 3800 | 2.6E-01 |
| 230 | < 1.0E-05 | 530 | < 1.0E-05 | 830 | 9.7E-01 | 1130 | 9.6E-01 | 2350 | 9.5E-01 | 3850 | 2.7E-01 |
| 240 | < 1.0E-05 | 540 | < 1.0E-05 | 840 | 9.6E-01 | 1140 | 9.6E-01 | 2400 | 9.5E-01 | 3900 | 2.7E-01 |
| 250 | < 1.0E-05 | 550 | < 1.0E-05 | 850 | 9.6E-01 | 1150 | 9.6E-01 | 2450 | 9.5E-01 | 3950 | 2.8E-01 |
| 260 | < 1.0E-05 | 560 | < 1.0E-05 | 860 | 9.6E-01 | 1160 | 9.6E-01 | 2500 | 9.4E-01 | 4000 | 2.8E-01 |
| 270 | < 1.0E-05 | 570 | < 1.0E-05 | 870 | 9.6E-01 | 1170 | 9.6E-01 | 2550 | 9.4E-01 | 4050 | 2.6E-01 |
| 280 | < 1.0E-05 | 580 | < 1.0E-05 | 880 | 9.6E-01 | 1180 | 9.6E-01 | 2600 | 9.4E-01 | 4100 | 2.4E-01 |
| 290 | < 1.0E-05 | 590 | 6.2E-05 | 890 | 9.6E-01 | 1190 | 9.6E-01 | 2650 | 9.3E-01 | 4150 | 2.2E-01 |
| 300 | < 1.0E-05 | 600 | 1.7E-03 | 900 | 9.6E-01 | 1200 | 9.6E-01 | 2700 | 8.7E-01 | 4200 | 1.9E-01 |
| 310 | < 1.0E-05 | 610 | 2.5E-02 | 910 | 9.6E-01 | 1250 | 9.6E-01 | 2750 | 5.2E-01 | 4250 | 1.6E-01 |
| 320 | < 1.0E-05 | 620 | 1.7E-01 | 920 | 9.6E-01 | 1300 | 9.6E-01 | 2800 | 3.8E-01 | 4300 | 1.2E-01 |
| 330 | < 1.0E-05 | 630 | 4.9E-01 | 930 | 9.6E-01 | 1350 | 9.7E-01 | 2850 | 3.7E-01 | 4350 | 8.3E-02 |
| 340 | < 1.0E-05 | 640 | 7.7E-01 | 940 | 9.6E-01 | 1400 | 9.7E-01 | 2900 | 3.8E-01 | 4400 | 4.9E-02 |
| 350 | < 1.0E-05 | 650 | 9.0E-01 | 950 | 9.6E-01 | 1450 | 9.7E-01 | 2950 | 3.8E-01 | 4450 | 2.4E-02 |
| 360 | < 1.0E-05 | 660 | 9.5E-01 | 960 | 9.6E-01 | 1500 | 9.7E-01 | 3000 | 3.7E-01 | 4500 | 1.1E-02 |
| 370 | < 1.0E-05 | 670 | 9.6E-01 | 970 | 9.6E-01 | 1550 | 9.8E-01 | 3050 | 3.5E-01 | 4550 | 4.7E-03 |
| 380 | < 1.0E-05 | 680 | 9.7E-01 | 980 | 9.6E-01 | 1600 | 9.8E-01 | 3100 | 3.2E-01 | 4600 | 1.7E-03 |
| 390 | < 1.0E-05 | 690 | 9.7E-01 | 990 | 9.6E-01 | 1650 | 9.8E-01 | 3150 | 2.9E-01 | 4650 | 7.5E-04 |
| 400 | < 1.0E-05 | 700 | 9.8E-01 | 1000 | 9.6E-01 | 1700 | 9.8E-01 | 3200 | 2.6E-01 | 4700 | 3.2E-04 |
| 410 | < 1.0E-05 | 710 | 9.8E-01 | 1010 | 9.6E-01 | 1750 | 9.8E-01 | 3250 | 2.4E-01 | 4750 | 1.6E-04 |
| 420 | < 1.0E-05 | 720 | 9.8E-01 | 1020 | 9.6E-01 | 1800 | 9.8E-01 | 3300 | 2.2E-01 | 4800 | 8.4E-05 |
| 430 | < 1.0E-05 | 730 | 9.8E-01 | 1030 | 9.6E-01 | 1850 | 9.8E-01 | 3350 | 2.1E-01 | 4850 | 4.4E-05 |
| 440 | < 1.0E-05 | 740 | 9.8E-01 | 1040 | 9.6E-01 | 1900 | 9.7E-01 | 3400 | 2.1E-01 | 4900 | 2.2E-05 |
| 450 | < 1.0E-05 | 750 | 9.7E-01 | 1050 | 9.6E-01 | 1950 | 9.7E-01 | 3450 | 2.1E-01 | 4950 | < 1.0E-05 |
| 460 | < 1.0E-05 | 760 | 9.7E-01 | 1060 | 9.6E-01 | 2000 | 9.7E-01 | 3500 | 2.1E-01 | 5000 | < 1.0E-05 |
| 470 | < 1.0E-05 | 770 | 9.7E-01 | 1070 | 9.6E-01 | 2050 | 9.7E-01 | 3550 | 2.2E-01 | 5050 | < 1.0E-05 |
| 480 | < 1.0E-05 | 780 | 9.7E-01 | 1080 | 9.6E-01 | 2100 | 9.7E-01 | 3600 | 2.2E-01 | 5100 | < 1.0E-05 |
| 490 | < 1.0E-05 | 790 | 9.7E-01 | 1090 | 9.6E-01 | 2150 | 9.7E-01 | 3650 | 2.3E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## RG645

| Density | |
|---|---|
| ρ [g/cm³] | 2.65 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 645 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 560 | |
| λp (τip = 0.94) [nm] | = | 720 | |

| Transformation temperature | |
|---|---|
| Tg [°C] | 519 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 8.0 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.2 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.52 |
| 852.1 | Cs | 1.52 |
| 1014 | Hg | 1.51 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.16 |

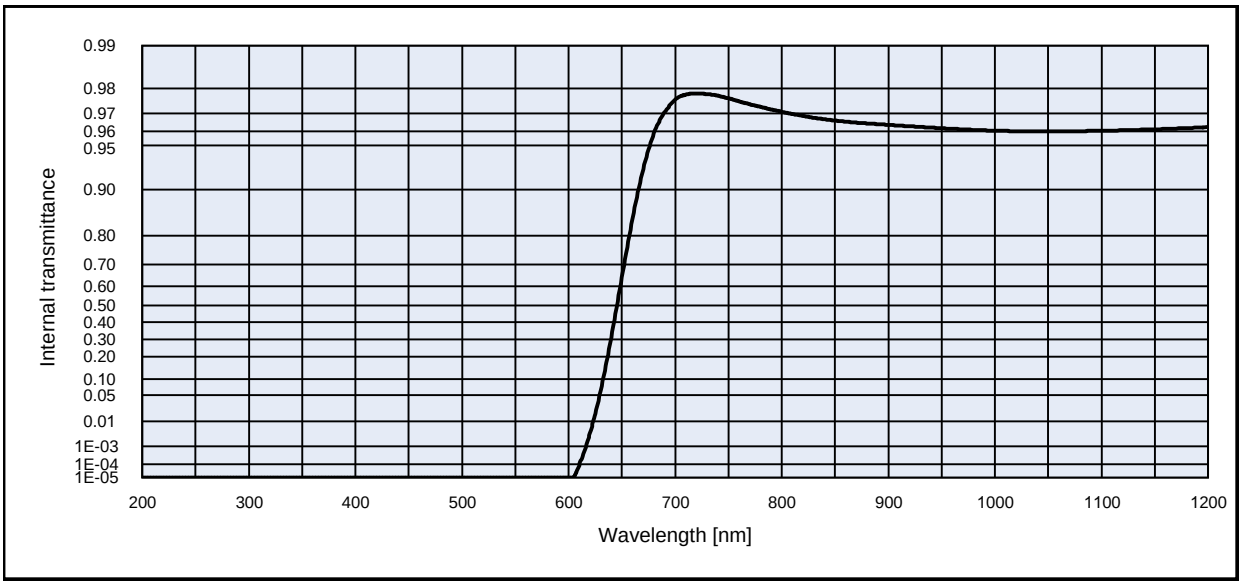
| Notes |
|---|
| Colloidally colored glass |
| Long pass filter |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.672 | 0.722 | 0.726 |
| y | 0.303 | 0.277 | 0.274 |
| Y | 9 | 5 | 4 |
| $\lambda_d$ [nm] | 640 | 647 | 651 |
| $P_e$ | 0.83 | 0.99 | 1.00 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.662 | 0.722 | 0.726 |
| y | 0.304 | 0.277 | 0.274 |
| Y | 8 | 4 | 3 |
| $\lambda_d$ [nm] | 640 | 646 | 651 |
| $P_e$ | 0.81 | 0.99 | 1.00 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.584 | 0.717 | 0.726 |
| y | 0.298 | 0.278 | 0.274 |
| Y | 5 | 2 | 2 |
| $\lambda_d$ [nm] | 638 | 645 | 650 |
| $P_e$ | 0.67 | 0.98 | 1.00 |



# RG645

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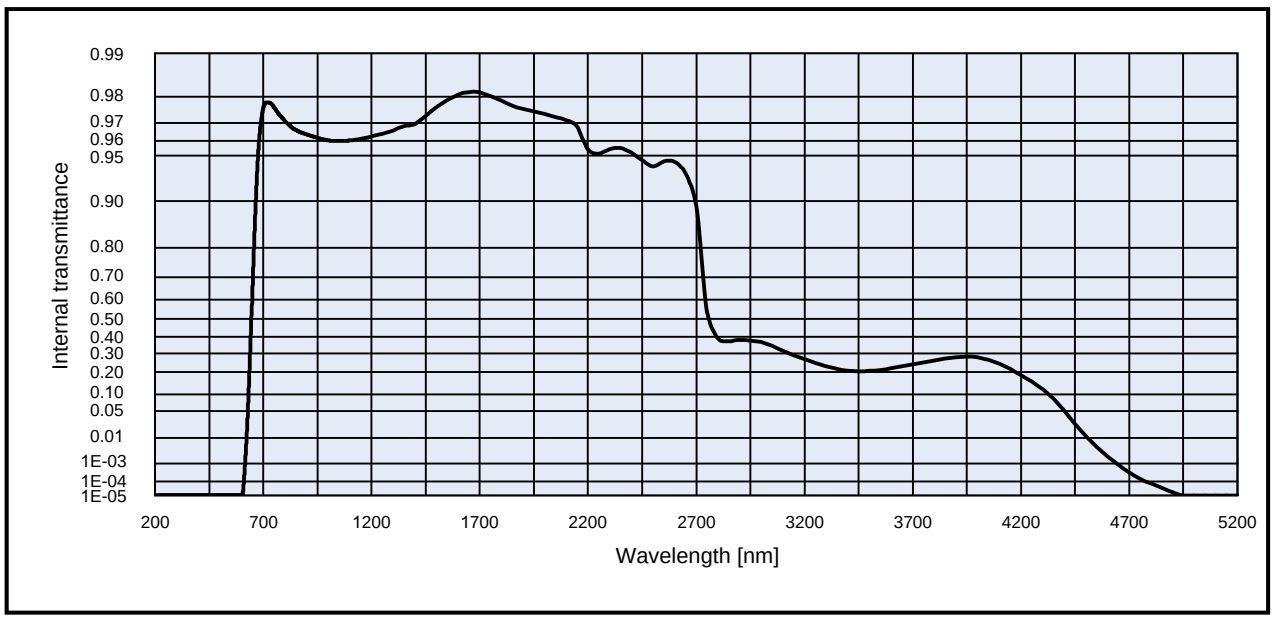



**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | < 1.0E-05 | 800 | 9.7E-01 | 1100 | 9.6E-01 | 2200 | 9.5E-01 | 3700 | 2.4E-01 |
| 210 | < 1.0E-05 | 510 | < 1.0E-05 | 810 | 9.7E-01 | 1110 | 9.6E-01 | 2250 | 9.5E-01 | 3750 | 2.5E-01 |
| 220 | < 1.0E-05 | 520 | < 1.0E-05 | 820 | 9.7E-01 | 1120 | 9.6E-01 | 2300 | 9.5E-01 | 3800 | 2.6E-01 |
| 230 | < 1.0E-05 | 530 | < 1.0E-05 | 830 | 9.7E-01 | 1130 | 9.6E-01 | 2350 | 9.6E-01 | 3850 | 2.7E-01 |
| 240 | < 1.0E-05 | 540 | < 1.0E-05 | 840 | 9.7E-01 | 1140 | 9.6E-01 | 2400 | 9.5E-01 | 3900 | 2.8E-01 |
| 250 | < 1.0E-05 | 550 | < 1.0E-05 | 850 | 9.7E-01 | 1150 | 9.6E-01 | 2450 | 9.5E-01 | 3950 | 2.8E-01 |
| 260 | < 1.0E-05 | 560 | < 1.0E-05 | 860 | 9.7E-01 | 1160 | 9.6E-01 | 2500 | 9.4E-01 | 4000 | 2.8E-01 |
| 270 | < 1.0E-05 | 570 | < 1.0E-05 | 870 | 9.7E-01 | 1170 | 9.6E-01 | 2550 | 9.5E-01 | 4050 | 2.7E-01 |
| 280 | < 1.0E-05 | 580 | < 1.0E-05 | 880 | 9.6E-01 | 1180 | 9.6E-01 | 2600 | 9.4E-01 | 4100 | 2.4E-01 |
| 290 | < 1.0E-05 | 590 | < 1.0E-05 | 890 | 9.6E-01 | 1190 | 9.6E-01 | 2650 | 9.3E-01 | 4150 | 2.2E-01 |
| 300 | < 1.0E-05 | 600 | < 1.0E-05 | 900 | 9.6E-01 | 1200 | 9.6E-01 | 2700 | 8.9E-01 | 4200 | 1.8E-01 |
| 310 | < 1.0E-05 | 610 | 7.6E-05 | 910 | 9.6E-01 | 1250 | 9.6E-01 | 2750 | 5.4E-01 | 4250 | 1.5E-01 |
| 320 | < 1.0E-05 | 620 | 3.6E-03 | 920 | 9.6E-01 | 1300 | 9.7E-01 | 2800 | 3.9E-01 | 4300 | 1.2E-01 |
| 330 | < 1.0E-05 | 630 | 6.1E-02 | 930 | 9.6E-01 | 1350 | 9.7E-01 | 2850 | 3.7E-01 | 4350 | 8.5E-02 |
| 340 | < 1.0E-05 | 640 | 3.1E-01 | 940 | 9.6E-01 | 1400 | 9.7E-01 | 2900 | 3.8E-01 | 4400 | 5.1E-02 |
| 350 | < 1.0E-05 | 650 | 6.5E-01 | 950 | 9.6E-01 | 1450 | 9.7E-01 | 2950 | 3.8E-01 | 4450 | 2.5E-02 |
| 360 | < 1.0E-05 | 660 | 8.4E-01 | 960 | 9.6E-01 | 1500 | 9.8E-01 | 3000 | 3.7E-01 | 4500 | 1.2E-02 |
| 370 | < 1.0E-05 | 670 | 9.3E-01 | 970 | 9.6E-01 | 1550 | 9.8E-01 | 3050 | 3.5E-01 | 4550 | 4.8E-03 |
| 380 | < 1.0E-05 | 680 | 9.6E-01 | 980 | 9.6E-01 | 1600 | 9.8E-01 | 3100 | 3.2E-01 | 4600 | 2.0E-03 |
| 390 | < 1.0E-05 | 690 | 9.7E-01 | 990 | 9.6E-01 | 1650 | 9.8E-01 | 3150 | 2.9E-01 | 4650 | 8.3E-04 |
| 400 | < 1.0E-05 | 700 | 9.8E-01 | 1000 | 9.6E-01 | 1700 | 9.8E-01 | 3200 | 2.7E-01 | 4700 | 3.3E-04 |
| 410 | < 1.0E-05 | 710 | 9.8E-01 | 1010 | 9.6E-01 | 1750 | 9.8E-01 | 3250 | 2.5E-01 | 4750 | 1.5E-04 |
| 420 | < 1.0E-05 | 720 | 9.8E-01 | 1020 | 9.6E-01 | 1800 | 9.8E-01 | 3300 | 2.3E-01 | 4800 | 7.3E-05 |
| 430 | < 1.0E-05 | 730 | 9.8E-01 | 1030 | 9.6E-01 | 1850 | 9.8E-01 | 3350 | 2.2E-01 | 4850 | 3.8E-05 |
| 440 | < 1.0E-05 | 740 | 9.8E-01 | 1040 | 9.6E-01 | 1900 | 9.8E-01 | 3400 | 2.1E-01 | 4900 | 1.7E-05 |
| 450 | < 1.0E-05 | 750 | 9.8E-01 | 1050 | 9.6E-01 | 1950 | 9.8E-01 | 3450 | 2.0E-01 | 4950 | < 1.0E-05 |
| 460 | < 1.0E-05 | 760 | 9.8E-01 | 1060 | 9.6E-01 | 2000 | 9.7E-01 | 3500 | 2.0E-01 | 5000 | < 1.0E-05 |
| 470 | < 1.0E-05 | 770 | 9.7E-01 | 1070 | 9.6E-01 | 2050 | 9.7E-01 | 3550 | 2.1E-01 | 5050 | < 1.0E-05 |
| 480 | < 1.0E-05 | 780 | 9.7E-01 | 1080 | 9.6E-01 | 2100 | 9.7E-01 | 3600 | 2.2E-01 | 5100 | < 1.0E-05 |
| 490 | < 1.0E-05 | 790 | 9.7E-01 | 1090 | 9.6E-01 | 2150 | 9.7E-01 | 3650 | 2.3E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## RG665

| Reflection factor | |
|---|---|
| $P_d$ | 0.91 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 665 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 580 | |
| λp (τip = 0.96) [nm] | = | 750 | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.54 |
| 852.1 | Cs | 1.53 |
| 1014 | Hg | 1.53 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.77 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 527 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 8.1 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.4 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.17 |

| Notes |
|---|
| |
| Colloidally colored glass |
| |
| Long pass filter |

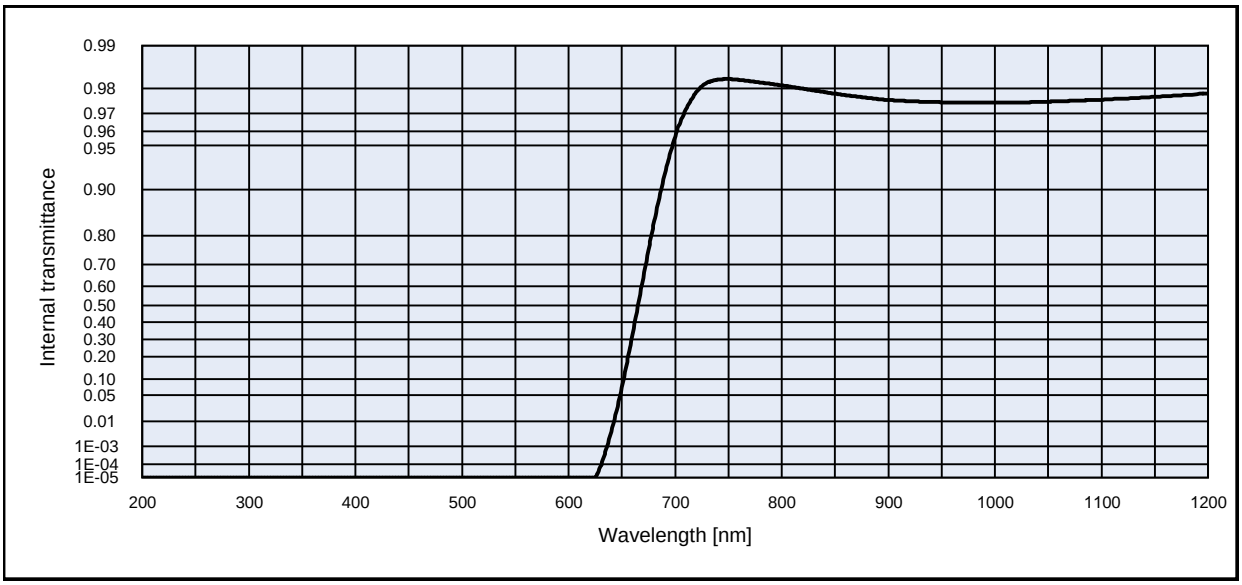
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.631 | 0.726 | 0.732 |
| y | 0.318 | 0.272 | 0.268 |
| Y | 4 | 2 | 1 |
| $\lambda_d$ [nm] | 656 | 664 | 671 |
| $P_e$ | 0.65 | 0.98 | 1.00 |

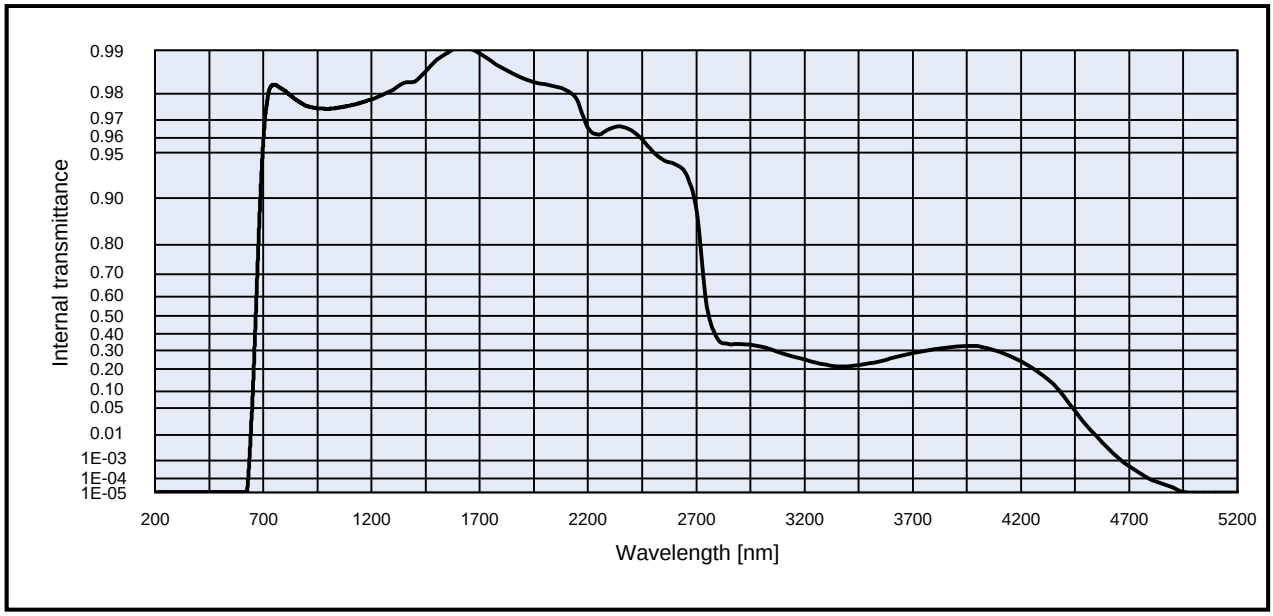
| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.612 | 0.724 | 0.732 |
| y | 0.320 | 0.272 | 0.268 |
| Y | 4 | 1 | 1 |
| $\lambda_d$ [nm] | 656 | 664 | 670 |
| $P_e$ | 0.62 | 0.98 | 1.00 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.487 | 0.711 | 0.731 |
| y | 0.305 | 0.272 | 0.268 |
| Y | 3 | 1 | 1 |
| $\lambda_d$ [nm] | 654 | 662 | 668 |
| $P_e$ | 0.42 | 0.95 | 1.00 |



# RG665

SCHOTT




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | < 1.0E-05 | 800 | 9.8E-01 | 1100 | 9.8E-01 | 2200 | 9.7E-01 | 3700 | 2.9E-01 |
| 210 | < 1.0E-05 | 510 | < 1.0E-05 | 810 | 9.8E-01 | 1110 | 9.8E-01 | 2250 | 9.6E-01 | 3750 | 3.0E-01 |
| 220 | < 1.0E-05 | 520 | < 1.0E-05 | 820 | 9.8E-01 | 1120 | 9.8E-01 | 2300 | 9.7E-01 | 3800 | 3.1E-01 |
| 230 | < 1.0E-05 | 530 | < 1.0E-05 | 830 | 9.8E-01 | 1130 | 9.8E-01 | 2350 | 9.7E-01 | 3850 | 3.2E-01 |
| 240 | < 1.0E-05 | 540 | < 1.0E-05 | 840 | 9.8E-01 | 1140 | 9.8E-01 | 2400 | 9.6E-01 | 3900 | 3.2E-01 |
| 250 | < 1.0E-05 | 550 | < 1.0E-05 | 850 | 9.8E-01 | 1150 | 9.8E-01 | 2450 | 9.6E-01 | 3950 | 3.3E-01 |
| 260 | < 1.0E-05 | 560 | < 1.0E-05 | 860 | 9.8E-01 | 1160 | 9.8E-01 | 2500 | 9.5E-01 | 4000 | 3.3E-01 |
| 270 | < 1.0E-05 | 570 | < 1.0E-05 | 870 | 9.8E-01 | 1170 | 9.8E-01 | 2550 | 9.4E-01 | 4050 | 3.1E-01 |
| 280 | < 1.0E-05 | 580 | < 1.0E-05 | 880 | 9.8E-01 | 1180 | 9.8E-01 | 2600 | 9.4E-01 | 4100 | 2.9E-01 |
| 290 | < 1.0E-05 | 590 | < 1.0E-05 | 890 | 9.8E-01 | 1190 | 9.8E-01 | 2650 | 9.3E-01 | 4150 | 2.7E-01 |
| 300 | < 1.0E-05 | 600 | < 1.0E-05 | 900 | 9.8E-01 | 1200 | 9.8E-01 | 2700 | 8.8E-01 | 4200 | 2.4E-01 |
| 310 | < 1.0E-05 | 610 | < 1.0E-05 | 910 | 9.8E-01 | 1250 | 9.8E-01 | 2750 | 5.5E-01 | 4250 | 2.1E-01 |
| 320 | < 1.0E-05 | 620 | < 1.0E-05 | 920 | 9.8E-01 | 1300 | 9.8E-01 | 2800 | 3.7E-01 | 4300 | 1.7E-01 |
| 330 | < 1.0E-05 | 630 | 7.4E-05 | 930 | 9.8E-01 | 1350 | 9.8E-01 | 2850 | 3.4E-01 | 4350 | 1.3E-01 |
| 340 | < 1.0E-05 | 640 | 4.3E-03 | 940 | 9.8E-01 | 1400 | 9.8E-01 | 2900 | 3.4E-01 | 4400 | 8.3E-02 |
| 350 | < 1.0E-05 | 650 | 7.2E-02 | 950 | 9.7E-01 | 1450 | 9.9E-01 | 2950 | 3.4E-01 | 4450 | 4.4E-02 |
| 360 | < 1.0E-05 | 660 | 3.3E-01 | 960 | 9.7E-01 | 1500 | 9.9E-01 | 3000 | 3.3E-01 | 4500 | 2.0E-02 |
| 370 | < 1.0E-05 | 670 | 6.4E-01 | 970 | 9.7E-01 | 1550 | 9.9E-01 | 3050 | 3.1E-01 | 4550 | 9.2E-03 |
| 380 | < 1.0E-05 | 680 | 8.3E-01 | 980 | 9.7E-01 | 1600 | 9.9E-01 | 3100 | 2.8E-01 | 4600 | 3.5E-03 |
| 390 | < 1.0E-05 | 690 | 9.2E-01 | 990 | 9.7E-01 | 1650 | 9.9E-01 | 3150 | 2.7E-01 | 4650 | 1.3E-03 |
| 400 | < 1.0E-05 | 700 | 9.6E-01 | 1000 | 9.7E-01 | 1700 | 9.9E-01 | 3200 | 2.5E-01 | 4700 | 5.0E-04 |
| 410 | < 1.0E-05 | 710 | 9.7E-01 | 1010 | 9.7E-01 | 1750 | 9.9E-01 | 3250 | 2.3E-01 | 4750 | 2.0E-04 |
| 420 | < 1.0E-05 | 720 | 9.8E-01 | 1020 | 9.7E-01 | 1800 | 9.9E-01 | 3300 | 2.2E-01 | 4800 | 8.7E-05 |
| 430 | < 1.0E-05 | 730 | 9.8E-01 | 1030 | 9.7E-01 | 1850 | 9.9E-01 | 3350 | 2.1E-01 | 4850 | 4.5E-05 |
| 440 | < 1.0E-05 | 740 | 9.8E-01 | 1040 | 9.8E-01 | 1900 | 9.8E-01 | 3400 | 2.1E-01 | 4900 | 2.5E-05 |
| 450 | < 1.0E-05 | 750 | 9.8E-01 | 1050 | 9.8E-01 | 1950 | 9.8E-01 | 3450 | 2.2E-01 | 4950 | 1.2E-05 |
| 460 | < 1.0E-05 | 760 | 9.8E-01 | 1060 | 9.8E-01 | 2000 | 9.8E-01 | 3500 | 2.3E-01 | 5000 | < 1.0E-05 |
| 470 | < 1.0E-05 | 770 | 9.8E-01 | 1070 | 9.8E-01 | 2050 | 9.8E-01 | 3550 | 2.4E-01 | 5050 | < 1.0E-05 |
| 480 | < 1.0E-05 | 780 | 9.8E-01 | 1080 | 9.8E-01 | 2100 | 9.8E-01 | 3600 | 2.6E-01 | 5100 | < 1.0E-05 |
| 490 | < 1.0E-05 | 790 | 9.8E-01 | 1090 | 9.8E-01 | 2150 | 9.8E-01 | 3650 | 2.7E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## RG695

| Density | |
|---|---|
| ρ [g/cm³] | 2.76 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.91 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 695 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 610 | |
| λp (τip = 0.96) [nm] | = | 780 | |

| Transformation temperature | |
|---|---|
| Tg [°C] | 532 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 8.1 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.4 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.54 |
| 852.1 | Cs | 1.53 |
| 1014 | Hg | 1.52 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.18 |

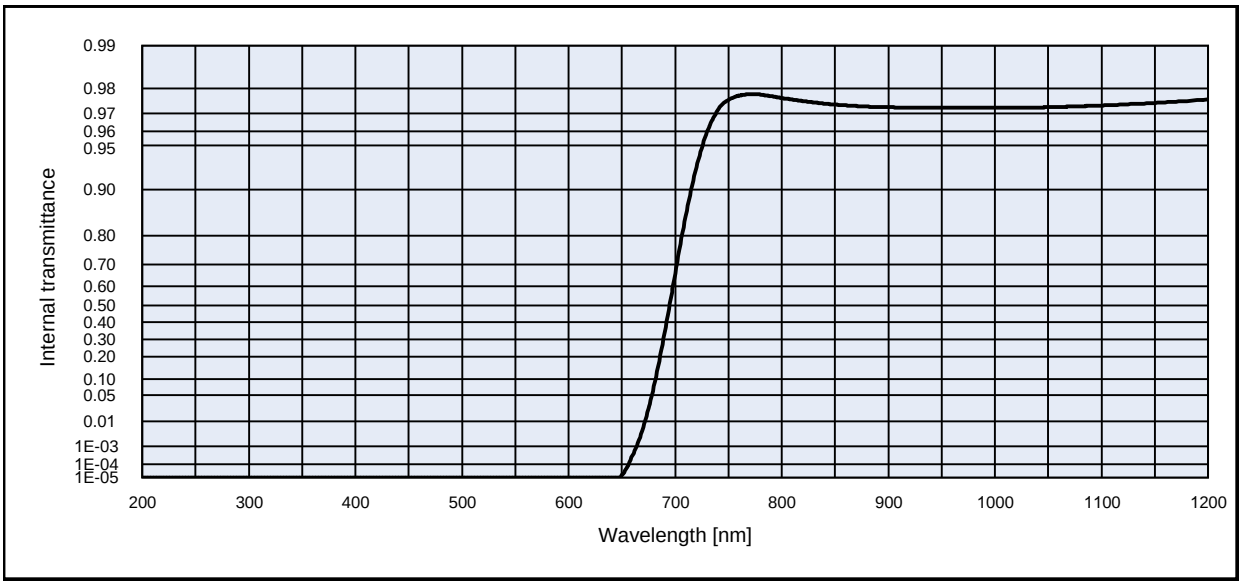
| Notes |
|---|
| |
| Colloidally colored glass |
| |
| Long pass filter |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# RG695

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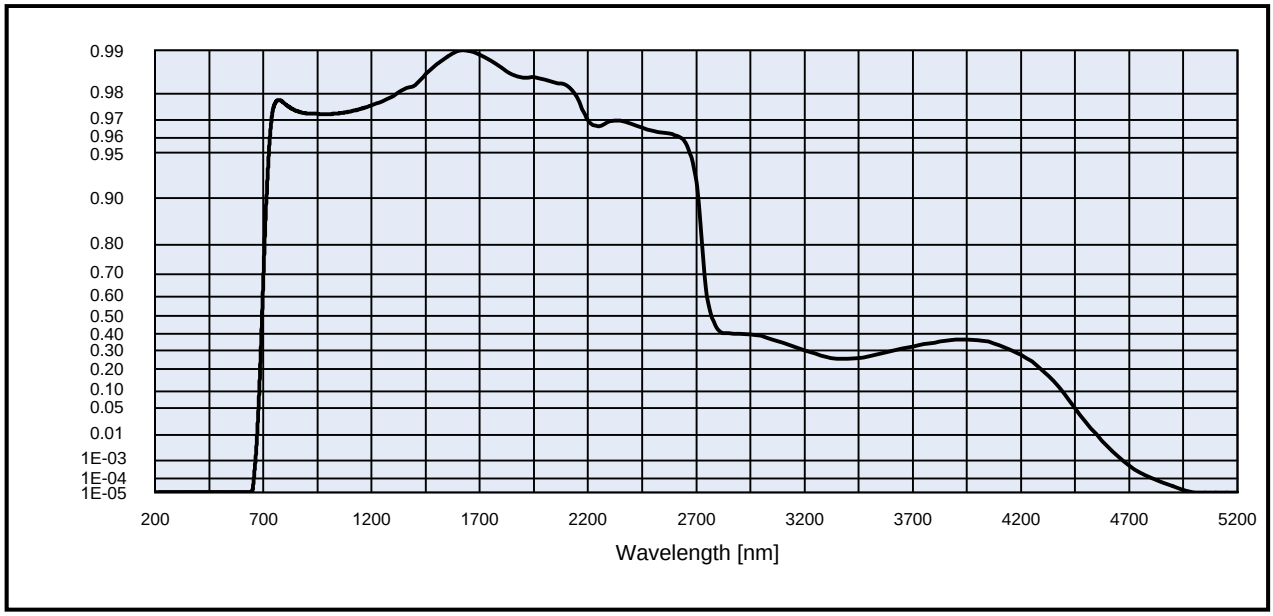



**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | < 1.0E-05 | 800 | 9.8E-01 | 1100 | 9.7E-01 | 2200 | 9.7E-01 | 3700 | 3.3E-01 |
| 210 | < 1.0E-05 | 510 | < 1.0E-05 | 810 | 9.8E-01 | 1110 | 9.7E-01 | 2250 | 9.7E-01 | 3750 | 3.4E-01 |
| 220 | < 1.0E-05 | 520 | < 1.0E-05 | 820 | 9.8E-01 | 1120 | 9.7E-01 | 2300 | 9.7E-01 | 3800 | 3.5E-01 |
| 230 | < 1.0E-05 | 530 | < 1.0E-05 | 830 | 9.7E-01 | 1130 | 9.7E-01 | 2350 | 9.7E-01 | 3850 | 3.6E-01 |
| 240 | < 1.0E-05 | 540 | < 1.0E-05 | 840 | 9.7E-01 | 1140 | 9.7E-01 | 2400 | 9.7E-01 | 3900 | 3.6E-01 |
| 250 | < 1.0E-05 | 550 | < 1.0E-05 | 850 | 9.7E-01 | 1150 | 9.7E-01 | 2450 | 9.7E-01 | 3950 | 3.7E-01 |
| 260 | < 1.0E-05 | 560 | < 1.0E-05 | 860 | 9.7E-01 | 1160 | 9.7E-01 | 2500 | 9.6E-01 | 4000 | 3.6E-01 |
| 270 | < 1.0E-05 | 570 | < 1.0E-05 | 870 | 9.7E-01 | 1170 | 9.8E-01 | 2550 | 9.6E-01 | 4050 | 3.5E-01 |
| 280 | < 1.0E-05 | 580 | < 1.0E-05 | 880 | 9.7E-01 | 1180 | 9.8E-01 | 2600 | 9.6E-01 | 4100 | 3.3E-01 |
| 290 | < 1.0E-05 | 590 | < 1.0E-05 | 890 | 9.7E-01 | 1190 | 9.8E-01 | 2650 | 9.6E-01 | 4150 | 3.1E-01 |
| 300 | < 1.0E-05 | 600 | < 1.0E-05 | 900 | 9.7E-01 | 1200 | 9.8E-01 | 2700 | 9.2E-01 | 4200 | 2.8E-01 |
| 310 | < 1.0E-05 | 610 | < 1.0E-05 | 910 | 9.7E-01 | 1250 | 9.8E-01 | 2750 | 6.1E-01 | 4250 | 2.4E-01 |
| 320 | < 1.0E-05 | 620 | < 1.0E-05 | 920 | 9.7E-01 | 1300 | 9.8E-01 | 2800 | 4.3E-01 | 4300 | 1.9E-01 |
| 330 | < 1.0E-05 | 630 | < 1.0E-05 | 930 | 9.7E-01 | 1350 | 9.8E-01 | 2850 | 4.0E-01 | 4350 | 1.4E-01 |
| 340 | < 1.0E-05 | 640 | < 1.0E-05 | 940 | 9.7E-01 | 1400 | 9.8E-01 | 2900 | 4.0E-01 | 4400 | 9.3E-02 |
| 350 | < 1.0E-05 | 650 | 1.5E-05 | 950 | 9.7E-01 | 1450 | 9.9E-01 | 2950 | 4.0E-01 | 4450 | 5.0E-02 |
| 360 | < 1.0E-05 | 660 | 3.4E-04 | 960 | 9.7E-01 | 1500 | 9.9E-01 | 3000 | 3.9E-01 | 4500 | 2.3E-02 |
| 370 | < 1.0E-05 | 670 | 6.3E-03 | 970 | 9.7E-01 | 1550 | 9.9E-01 | 3050 | 3.7E-01 | 4550 | 1.0E-02 |
| 380 | < 1.0E-05 | 680 | 7.5E-02 | 980 | 9.7E-01 | 1600 | 9.9E-01 | 3100 | 3.5E-01 | 4600 | 4.0E-03 |
| 390 | < 1.0E-05 | 690 | 3.4E-01 | 990 | 9.7E-01 | 1650 | 9.9E-01 | 3150 | 3.2E-01 | 4650 | 1.5E-03 |
| 400 | < 1.0E-05 | 700 | 6.6E-01 | 1000 | 9.7E-01 | 1700 | 9.9E-01 | 3200 | 3.0E-01 | 4700 | 5.3E-04 |
| 410 | < 1.0E-05 | 710 | 8.5E-01 | 1010 | 9.7E-01 | 1750 | 9.9E-01 | 3250 | 2.8E-01 | 4750 | 2.2E-04 |
| 420 | < 1.0E-05 | 720 | 9.3E-01 | 1020 | 9.7E-01 | 1800 | 9.9E-01 | 3300 | 2.7E-01 | 4800 | 1.1E-04 |
| 430 | < 1.0E-05 | 730 | 9.6E-01 | 1030 | 9.7E-01 | 1850 | 9.9E-01 | 3350 | 2.6E-01 | 4850 | 5.6E-05 |
| 440 | < 1.0E-05 | 740 | 9.7E-01 | 1040 | 9.7E-01 | 1900 | 9.8E-01 | 3400 | 2.5E-01 | 4900 | 3.1E-05 |
| 450 | < 1.0E-05 | 750 | 9.8E-01 | 1050 | 9.7E-01 | 1950 | 9.8E-01 | 3450 | 2.6E-01 | 4950 | 1.6E-05 |
| 460 | < 1.0E-05 | 760 | 9.8E-01 | 1060 | 9.7E-01 | 2000 | 9.8E-01 | 3500 | 2.7E-01 | 5000 | < 1.0E-05 |
| 470 | < 1.0E-05 | 770 | 9.8E-01 | 1070 | 9.7E-01 | 2050 | 9.8E-01 | 3550 | 2.8E-01 | 5050 | < 1.0E-05 |
| 480 | < 1.0E-05 | 780 | 9.8E-01 | 1080 | 9.7E-01 | 2100 | 9.8E-01 | 3600 | 3.0E-01 | 5100 | < 1.0E-05 |
| 490 | < 1.0E-05 | 790 | 9.8E-01 | 1090 | 9.7E-01 | 2150 | 9.8E-01 | 3650 | 3.1E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## RG715

| Density | |
|---|---|
| ρ [g/cm³] | 2.76 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.91 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 715 | ± 9 |
| λs (τis = 1·10-5) [nm] | = | 620 | |
| λp (τip = 0.96) [nm] | = | 810 | |

| Transformation temperature | |
|---|---|
| Tg [°C] | 532 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 8.1 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.4 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.53 |
| 852.1 | Cs | 1.53 |
| 1014 | Hg | 1.52 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.18 |

**Notes**

Colloidally colored glass

Long pass filter

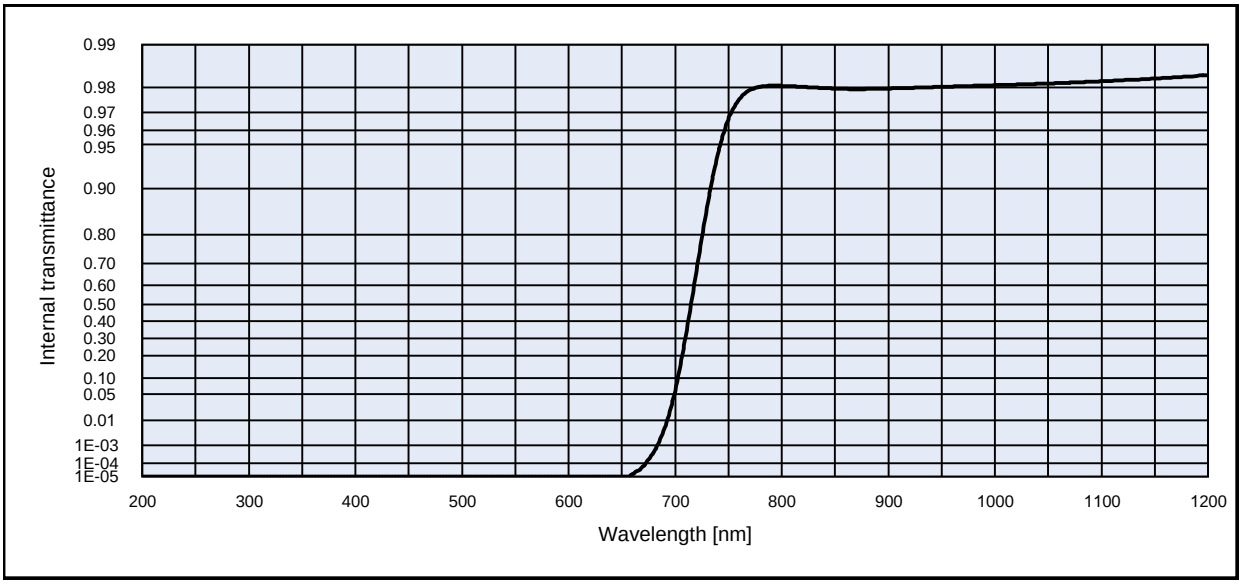
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

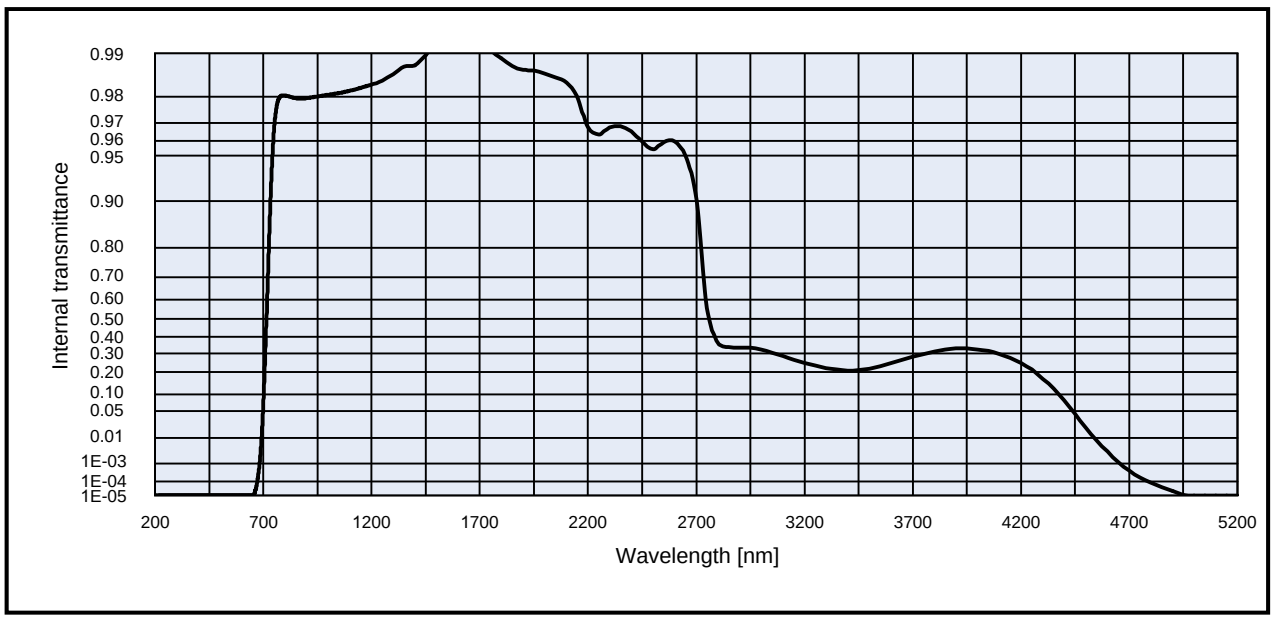
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# RG715




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | < 1.0E-05 | 800 | 9.8E-01 | 1100 | 9.8E-01 | 2200 | 9.7E-01 | 3700 | 2.8E-01 |
| 210 | < 1.0E-05 | 510 | < 1.0E-05 | 810 | 9.8E-01 | 1110 | 9.8E-01 | 2250 | 9.6E-01 | 3750 | 3.0E-01 |
| 220 | < 1.0E-05 | 520 | < 1.0E-05 | 820 | 9.8E-01 | 1120 | 9.8E-01 | 2300 | 9.7E-01 | 3800 | 3.1E-01 |
| 230 | < 1.0E-05 | 530 | < 1.0E-05 | 830 | 9.8E-01 | 1130 | 9.8E-01 | 2350 | 9.7E-01 | 3850 | 3.2E-01 |
| 240 | < 1.0E-05 | 540 | < 1.0E-05 | 840 | 9.8E-01 | 1140 | 9.8E-01 | 2400 | 9.7E-01 | 3900 | 3.3E-01 |
| 250 | < 1.0E-05 | 550 | < 1.0E-05 | 850 | 9.8E-01 | 1150 | 9.8E-01 | 2450 | 9.6E-01 | 3950 | 3.3E-01 |
| 260 | < 1.0E-05 | 560 | < 1.0E-05 | 860 | 9.8E-01 | 1160 | 9.8E-01 | 2500 | 9.5E-01 | 4000 | 3.3E-01 |
| 270 | < 1.0E-05 | 570 | < 1.0E-05 | 870 | 9.8E-01 | 1170 | 9.8E-01 | 2550 | 9.6E-01 | 4050 | 3.2E-01 |
| 280 | < 1.0E-05 | 580 | < 1.0E-05 | 880 | 9.8E-01 | 1180 | 9.8E-01 | 2600 | 9.6E-01 | 4100 | 3.0E-01 |
| 290 | < 1.0E-05 | 590 | < 1.0E-05 | 890 | 9.8E-01 | 1190 | 9.8E-01 | 2650 | 9.5E-01 | 4150 | 2.8E-01 |
| 300 | < 1.0E-05 | 600 | < 1.0E-05 | 900 | 9.8E-01 | 1200 | 9.8E-01 | 2700 | 9.0E-01 | 4200 | 2.5E-01 |
| 310 | < 1.0E-05 | 610 | < 1.0E-05 | 910 | 9.8E-01 | 1250 | 9.8E-01 | 2750 | 5.6E-01 | 4250 | 2.1E-01 |
| 320 | < 1.0E-05 | 620 | < 1.0E-05 | 920 | 9.8E-01 | 1300 | 9.9E-01 | 2800 | 3.7E-01 | 4300 | 1.7E-01 |
| 330 | < 1.0E-05 | 630 | < 1.0E-05 | 930 | 9.8E-01 | 1350 | 9.9E-01 | 2850 | 3.4E-01 | 4350 | 1.2E-01 |
| 340 | < 1.0E-05 | 640 | < 1.0E-05 | 940 | 9.8E-01 | 1400 | 9.9E-01 | 2900 | 3.4E-01 | 4400 | 8.0E-02 |
| 350 | < 1.0E-05 | 650 | < 1.0E-05 | 950 | 9.8E-01 | 1450 | 9.9E-01 | 2950 | 3.3E-01 | 4450 | 4.4E-02 |
| 360 | < 1.0E-05 | 660 | 1.6E-05 | 960 | 9.8E-01 | 1500 | 9.9E-01 | 3000 | 3.2E-01 | 4500 | 2.0E-02 |
| 370 | < 1.0E-05 | 670 | 6.3E-05 | 970 | 9.8E-01 | 1550 | 9.9E-01 | 3050 | 3.1E-01 | 4550 | 8.4E-03 |
| 380 | < 1.0E-05 | 680 | 4.5E-04 | 980 | 9.8E-01 | 1600 | 9.9E-01 | 3100 | 2.9E-01 | 4600 | 3.3E-03 |
| 390 | < 1.0E-05 | 690 | 5.4E-03 | 990 | 9.8E-01 | 1650 | 9.9E-01 | 3150 | 2.7E-01 | 4650 | 1.1E-03 |
| 400 | < 1.0E-05 | 700 | 5.9E-02 | 1000 | 9.8E-01 | 1700 | 9.9E-01 | 3200 | 2.5E-01 | 4700 | 4.4E-04 |
| 410 | < 1.0E-05 | 710 | 3.1E-01 | 1010 | 9.8E-01 | 1750 | 9.9E-01 | 3250 | 2.3E-01 | 4750 | 1.8E-04 |
| 420 | < 1.0E-05 | 720 | 6.7E-01 | 1020 | 9.8E-01 | 1800 | 9.9E-01 | 3300 | 2.2E-01 | 4800 | 8.3E-05 |
| 430 | < 1.0E-05 | 730 | 8.7E-01 | 1030 | 9.8E-01 | 1850 | 9.9E-01 | 3350 | 2.1E-01 | 4850 | 4.2E-05 |
| 440 | < 1.0E-05 | 740 | 9.4E-01 | 1040 | 9.8E-01 | 1900 | 9.9E-01 | 3400 | 2.1E-01 | 4900 | 2.2E-05 |
| 450 | < 1.0E-05 | 750 | 9.7E-01 | 1050 | 9.8E-01 | 1950 | 9.9E-01 | 3450 | 2.1E-01 | 4950 | 1.1E-05 |
| 460 | < 1.0E-05 | 760 | 9.8E-01 | 1060 | 9.8E-01 | 2000 | 9.9E-01 | 3500 | 2.2E-01 | 5000 | < 1.0E-05 |
| 470 | < 1.0E-05 | 770 | 9.8E-01 | 1070 | 9.8E-01 | 2050 | 9.9E-01 | 3550 | 2.3E-01 | 5050 | < 1.0E-05 |
| 480 | < 1.0E-05 | 780 | 9.8E-01 | 1080 | 9.8E-01 | 2100 | 9.8E-01 | 3600 | 2.5E-01 | 5100 | < 1.0E-05 |
| 490 | < 1.0E-05 | 790 | 9.8E-01 | 1090 | 9.8E-01 | 2150 | 9.8E-01 | 3650 | 2.6E-01 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## RG780

| Density | |
|---|---|
| ρ [g/cm³] | 2.94 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.91 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Chemical resistance | |
|---|---|
| FR class | 5 |
| SR class | 53.4 |
| AR class | 1.3 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 780 | ± 9 |
| λs (τis = 1·10-5) [nm] | = | 610 | |
| λp (τip = 0.97) [nm] | = | 900 | |

| Transformation temperature | |
|---|---|
| Tg [°C] | 552 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 9.5 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 10.5 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.56 |
| 852.1 | Cs | 1.56 |
| 1014 | Hg | 1.55 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.22 |

| Notes |
|---|
| |
| Colloidally colored glass |
| |
| Long pass filter |
| |
| |
| |
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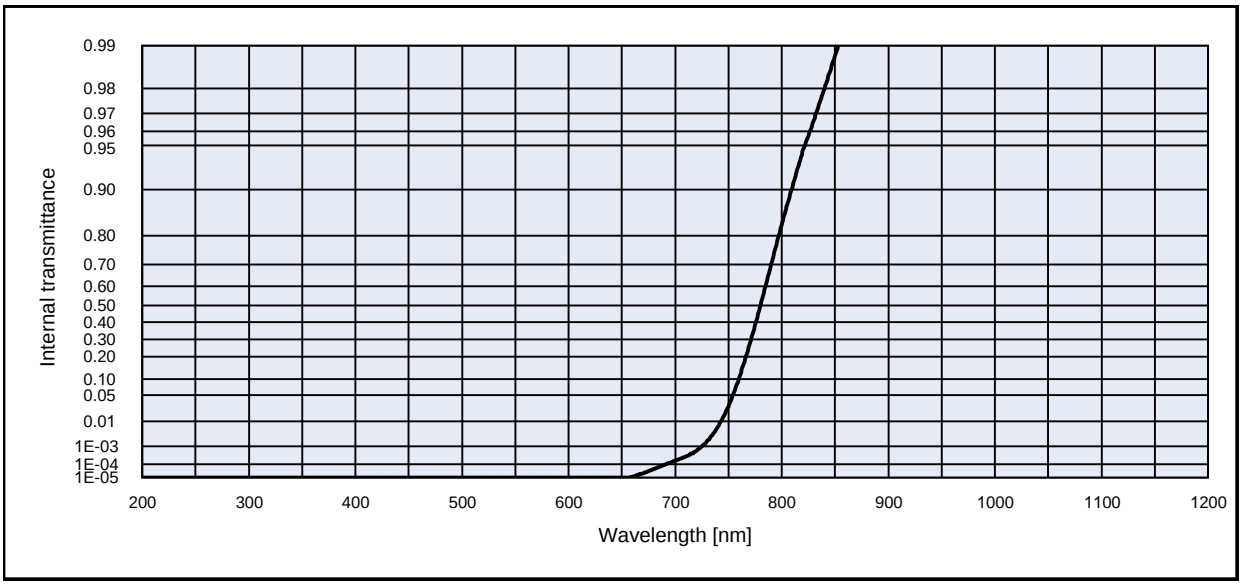
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

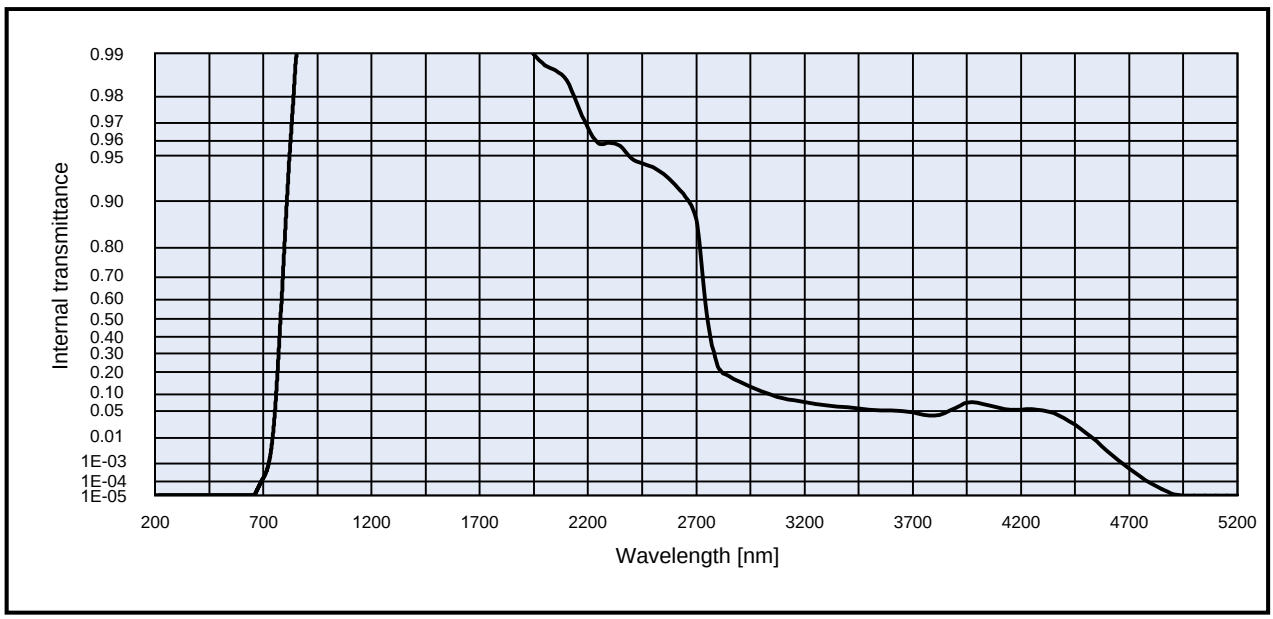
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# RG780




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | < 1.0E-05 | 800 | 8.3E-01 | 1100 | 1.0E+00 | 2200 | 9.7E-01 | 3700 | 4.6E-02 |
| 210 | < 1.0E-05 | 510 | < 1.0E-05 | 810 | 9.0E-01 | 1110 | 1.0E+00 | 2250 | 9.6E-01 | 3750 | 4.1E-02 |
| 220 | < 1.0E-05 | 520 | < 1.0E-05 | 820 | 9.5E-01 | 1120 | 1.0E+00 | 2300 | 9.6E-01 | 3800 | 4.0E-02 |
| 230 | < 1.0E-05 | 530 | < 1.0E-05 | 830 | 9.7E-01 | 1130 | 1.0E+00 | 2350 | 9.6E-01 | 3850 | 4.6E-02 |
| 240 | < 1.0E-05 | 540 | < 1.0E-05 | 840 | 9.8E-01 | 1140 | 1.0E+00 | 2400 | 9.5E-01 | 3900 | 5.7E-02 |
| 250 | < 1.0E-05 | 550 | < 1.0E-05 | 850 | 9.9E-01 | 1150 | 1.0E+00 | 2450 | 9.4E-01 | 3950 | 7.3E-02 |
| 260 | < 1.0E-05 | 560 | < 1.0E-05 | 860 | 9.9E-01 | 1160 | 1.0E+00 | 2500 | 9.4E-01 | 4000 | 7.3E-02 |
| 270 | < 1.0E-05 | 570 | < 1.0E-05 | 870 | 1.0E+00 | 1170 | 1.0E+00 | 2550 | 9.3E-01 | 4050 | 6.6E-02 |
| 280 | < 1.0E-05 | 580 | < 1.0E-05 | 880 | 1.0E+00 | 1180 | 1.0E+00 | 2600 | 9.2E-01 | 4100 | 5.7E-02 |
| 290 | < 1.0E-05 | 590 | < 1.0E-05 | 890 | 1.0E+00 | 1190 | 1.0E+00 | 2650 | 9.1E-01 | 4150 | 5.2E-02 |
| 300 | < 1.0E-05 | 600 | < 1.0E-05 | 900 | 1.0E+00 | 1200 | 1.0E+00 | 2700 | 8.7E-01 | 4200 | 5.4E-02 |
| 310 | < 1.0E-05 | 610 | < 1.0E-05 | 910 | 1.0E+00 | 1250 | 1.0E+00 | 2750 | 5.3E-01 | 4250 | 5.4E-02 |
| 320 | < 1.0E-05 | 620 | < 1.0E-05 | 920 | 1.0E+00 | 1300 | 1.0E+00 | 2800 | 2.3E-01 | 4300 | 5.2E-02 |
| 330 | < 1.0E-05 | 630 | < 1.0E-05 | 930 | 1.0E+00 | 1350 | 1.0E+00 | 2850 | 1.8E-01 | 4350 | 4.5E-02 |
| 340 | < 1.0E-05 | 640 | < 1.0E-05 | 940 | 1.0E+00 | 1400 | 1.0E+00 | 2900 | 1.5E-01 | 4400 | 3.5E-02 |
| 350 | < 1.0E-05 | 650 | < 1.0E-05 | 950 | 1.0E+00 | 1450 | 1.0E+00 | 2950 | 1.3E-01 | 4450 | 2.4E-02 |
| 360 | < 1.0E-05 | 660 | 1.2E-05 | 960 | 1.0E+00 | 1500 | 1.0E+00 | 3000 | 1.1E-01 | 4500 | 1.5E-02 |
| 370 | < 1.0E-05 | 670 | 2.3E-05 | 970 | 1.0E+00 | 1550 | 1.0E+00 | 3050 | 9.8E-02 | 4550 | 8.0E-03 |
| 380 | < 1.0E-05 | 680 | 4.6E-05 | 980 | 1.0E+00 | 1600 | 1.0E+00 | 3100 | 8.8E-02 | 4600 | 3.4E-03 |
| 390 | < 1.0E-05 | 690 | 9.0E-05 | 990 | 1.0E+00 | 1650 | 1.0E+00 | 3150 | 8.0E-02 | 4650 | 1.4E-03 |
| 400 | < 1.0E-05 | 700 | 1.6E-04 | 1000 | 1.0E+00 | 1700 | 1.0E+00 | 3200 | 7.4E-02 | 4700 | 5.5E-04 |
| 410 | < 1.0E-05 | 710 | 2.9E-04 | 1010 | 1.0E+00 | 1750 | 1.0E+00 | 3250 | 6.9E-02 | 4750 | 2.0E-04 |
| 420 | < 1.0E-05 | 720 | 6.0E-04 | 1020 | 1.0E+00 | 1800 | 9.9E-01 | 3300 | 6.5E-02 | 4800 | 7.4E-05 |
| 430 | < 1.0E-05 | 730 | 1.7E-03 | 1030 | 1.0E+00 | 1850 | 9.9E-01 | 3350 | 6.2E-02 | 4850 | 3.0E-05 |
| 440 | < 1.0E-05 | 740 | 6.4E-03 | 1040 | 1.0E+00 | 1900 | 9.9E-01 | 3400 | 5.9E-02 | 4900 | 1.2E-05 |
| 450 | < 1.0E-05 | 750 | 2.7E-02 | 1050 | 1.0E+00 | 1950 | 9.9E-01 | 3450 | 5.6E-02 | 4950 | < 1.0E-05 |
| 460 | < 1.0E-05 | 760 | 1.0E-01 | 1060 | 1.0E+00 | 2000 | 9.9E-01 | 3500 | 5.4E-02 | 5000 | < 1.0E-05 |
| 470 | < 1.0E-05 | 770 | 2.7E-01 | 1070 | 1.0E+00 | 2050 | 9.9E-01 | 3550 | 5.2E-02 | 5050 | < 1.0E-05 |
| 480 | < 1.0E-05 | 780 | 5.0E-01 | 1080 | 1.0E+00 | 2100 | 9.8E-01 | 3600 | 5.2E-02 | 5100 | < 1.0E-05 |
| 490 | < 1.0E-05 | 790 | 7.0E-01 | 1090 | 1.0E+00 | 2150 | 9.8E-01 | 3650 | 5.1E-02 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## RG830

| Density | |
|---|---|
| ρ [g/cm³] | 2.94 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.91 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Chemical resistance | |
|---|---|
| FR class | 5 |
| SR class | 53.4 |
| AR class | 1.3 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 830 | ± 9 |
| λs (τis = 1·10-5) [nm] | = | 670 | |
| λp (τip = 0.97) [nm] | = | 950 | |

| Transformation temperature | |
|---|---|
| Tg [°C] | 554 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 9.5 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 10.5 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.56 |
| 852.1 | Cs | 1.55 |
| 1014 | Hg | 1.55 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.23 |

| Notes |
|---|
| |
| Colloidally colored glass |
| |
| Long pass filter |
| |
| |
| |
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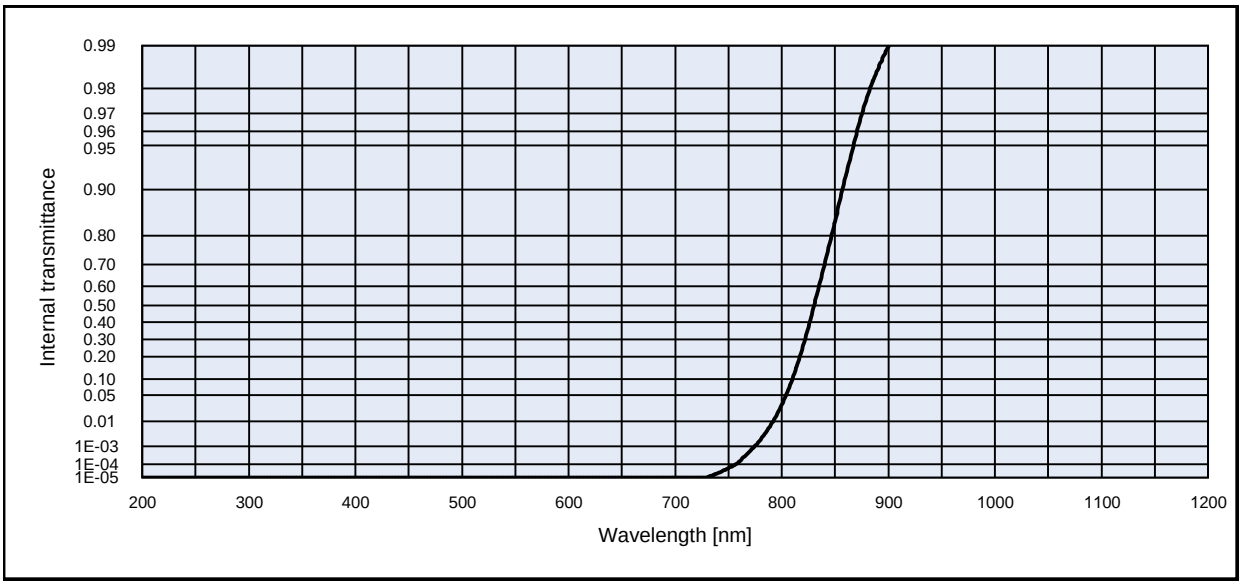
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

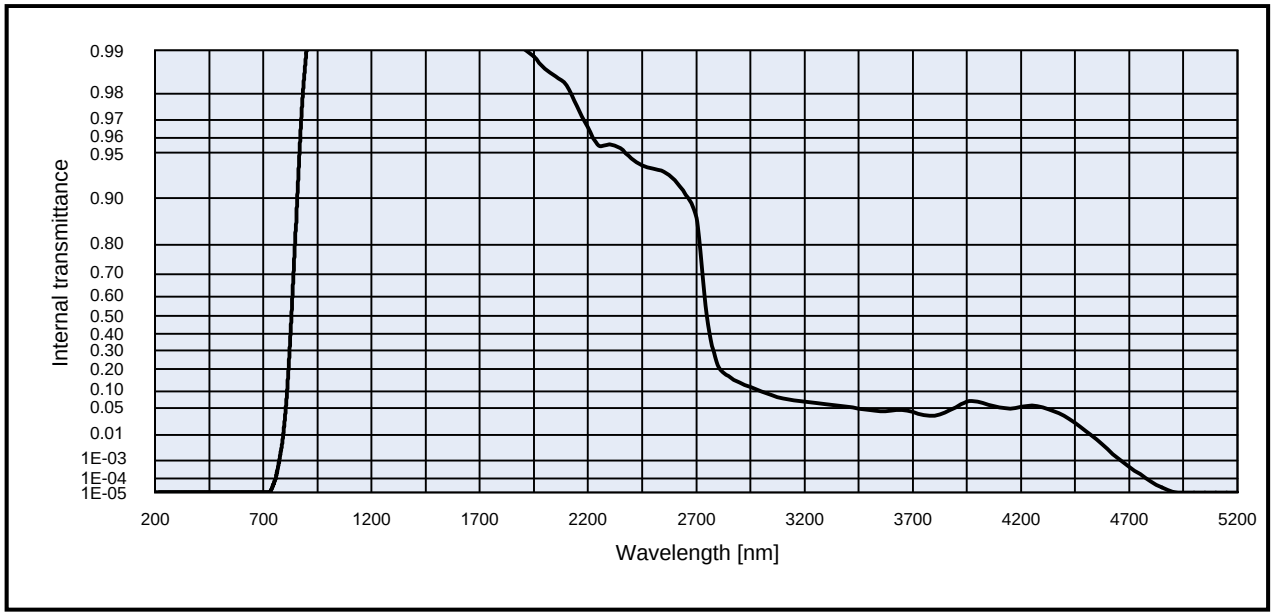
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# RG830




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | < 1.0E-05 | 800 | 3.0E-02 | 1100 | 1.0E+00 | 2200 | 9.7E-01 | 3700 | 4.1E-02 |
| 210 | < 1.0E-05 | 510 | < 1.0E-05 | 810 | 9.9E-02 | 1110 | 1.0E+00 | 2250 | 9.6E-01 | 3750 | 3.6E-02 |
| 220 | < 1.0E-05 | 520 | < 1.0E-05 | 820 | 2.6E-01 | 1120 | 1.0E+00 | 2300 | 9.6E-01 | 3800 | 3.4E-02 |
| 230 | < 1.0E-05 | 530 | < 1.0E-05 | 830 | 4.9E-01 | 1130 | 1.0E+00 | 2350 | 9.5E-01 | 3850 | 4.1E-02 |
| 240 | < 1.0E-05 | 540 | < 1.0E-05 | 840 | 7.0E-01 | 1140 | 1.0E+00 | 2400 | 9.5E-01 | 3900 | 5.1E-02 |
| 250 | < 1.0E-05 | 550 | < 1.0E-05 | 850 | 8.4E-01 | 1150 | 1.0E+00 | 2450 | 9.4E-01 | 3950 | 6.6E-02 |
| 260 | < 1.0E-05 | 560 | < 1.0E-05 | 860 | 9.2E-01 | 1160 | 1.0E+00 | 2500 | 9.4E-01 | 4000 | 6.7E-02 |
| 270 | < 1.0E-05 | 570 | < 1.0E-05 | 870 | 9.6E-01 | 1170 | 1.0E+00 | 2550 | 9.3E-01 | 4050 | 5.9E-02 |
| 280 | < 1.0E-05 | 580 | < 1.0E-05 | 880 | 9.8E-01 | 1180 | 1.0E+00 | 2600 | 9.2E-01 | 4100 | 5.1E-02 |
| 290 | < 1.0E-05 | 590 | < 1.0E-05 | 890 | 9.9E-01 | 1190 | 1.0E+00 | 2650 | 9.0E-01 | 4150 | 4.8E-02 |
| 300 | < 1.0E-05 | 600 | < 1.0E-05 | 900 | 9.9E-01 | 1200 | 1.0E+00 | 2700 | 8.6E-01 | 4200 | 5.4E-02 |
| 310 | < 1.0E-05 | 610 | < 1.0E-05 | 910 | 9.9E-01 | 1250 | 1.0E+00 | 2750 | 5.0E-01 | 4250 | 5.6E-02 |
| 320 | < 1.0E-05 | 620 | < 1.0E-05 | 920 | 9.9E-01 | 1300 | 1.0E+00 | 2800 | 2.2E-01 | 4300 | 5.1E-02 |
| 330 | < 1.0E-05 | 630 | < 1.0E-05 | 930 | 1.0E+00 | 1350 | 1.0E+00 | 2850 | 1.7E-01 | 4350 | 4.3E-02 |
| 340 | < 1.0E-05 | 640 | < 1.0E-05 | 940 | 1.0E+00 | 1400 | 1.0E+00 | 2900 | 1.4E-01 | 4400 | 3.3E-02 |
| 350 | < 1.0E-05 | 650 | < 1.0E-05 | 950 | 1.0E+00 | 1450 | 1.0E+00 | 2950 | 1.2E-01 | 4450 | 2.2E-02 |
| 360 | < 1.0E-05 | 660 | < 1.0E-05 | 960 | 1.0E+00 | 1500 | 1.0E+00 | 3000 | 1.0E-01 | 4500 | 1.3E-02 |
| 370 | < 1.0E-05 | 670 | < 1.0E-05 | 970 | 1.0E+00 | 1550 | 1.0E+00 | 3050 | 8.6E-02 | 4550 | 7.1E-03 |
| 380 | < 1.0E-05 | 680 | < 1.0E-05 | 980 | 1.0E+00 | 1600 | 1.0E+00 | 3100 | 7.7E-02 | 4600 | 3.1E-03 |
| 390 | < 1.0E-05 | 690 | < 1.0E-05 | 990 | 1.0E+00 | 1650 | 1.0E+00 | 3150 | 7.0E-02 | 4650 | 1.2E-03 |
| 400 | < 1.0E-05 | 700 | < 1.0E-05 | 1000 | 1.0E+00 | 1700 | 1.0E+00 | 3200 | 6.6E-02 | 4700 | 4.9E-04 |
| 410 | < 1.0E-05 | 710 | < 1.0E-05 | 1010 | 1.0E+00 | 1750 | 9.9E-01 | 3250 | 6.3E-02 | 4750 | 1.8E-04 |
| 420 | < 1.0E-05 | 720 | < 1.0E-05 | 1020 | 1.0E+00 | 1800 | 9.9E-01 | 3300 | 5.9E-02 | 4800 | 6.2E-05 |
| 430 | < 1.0E-05 | 730 | 1.0E-05 | 1030 | 1.0E+00 | 1850 | 9.9E-01 | 3350 | 5.6E-02 | 4850 | 2.4E-05 |
| 440 | < 1.0E-05 | 740 | 2.3E-05 | 1040 | 1.0E+00 | 1900 | 9.9E-01 | 3400 | 5.2E-02 | 4900 | 1.1E-05 |
| 450 | < 1.0E-05 | 750 | 5.2E-05 | 1050 | 1.0E+00 | 1950 | 9.9E-01 | 3450 | 4.9E-02 | 4950 | < 1.0E-05 |
| 460 | < 1.0E-05 | 760 | 1.4E-04 | 1060 | 1.0E+00 | 2000 | 9.9E-01 | 3500 | 4.6E-02 | 5000 | < 1.0E-05 |
| 470 | < 1.0E-05 | 770 | 5.6E-04 | 1070 | 1.0E+00 | 2050 | 9.8E-01 | 3550 | 4.3E-02 | 5050 | < 1.0E-05 |
| 480 | < 1.0E-05 | 780 | 2.0E-03 | 1080 | 1.0E+00 | 2100 | 9.8E-01 | 3600 | 4.4E-02 | 5100 | < 1.0E-05 |
| 490 | < 1.0E-05 | 790 | 7.8E-03 | 1090 | 1.0E+00 | 2150 | 9.8E-01 | 3650 | 4.5E-02 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## RG850

| Reflection factor | |
|---|---|
| $P_d$ | 0.91 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 850 | ± 9 |
| λs (τis = 1·10-5) [nm] | = | 700 | |
| λp1 (τip1 = 0.90) [nm] | = | 950 | |
| λp2 (τip2 = 0.97) [nm] | = | 1200 | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.56 |
| 852.1 | Cs | 1.55 |
| 1014 | Hg | 1.55 |

| Density | |
|---|---|
| ρ [g/cm³] | 2.93 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Chemical resistance | |
|---|---|
| FR class | 5 |
| SR class | 53.4 |
| AR class | 1.3 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 554 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 9.5 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 10.5 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.24 |

| Notes |
|---|
| |
| Colloidally colored glass |
| |
| Long pass filter |

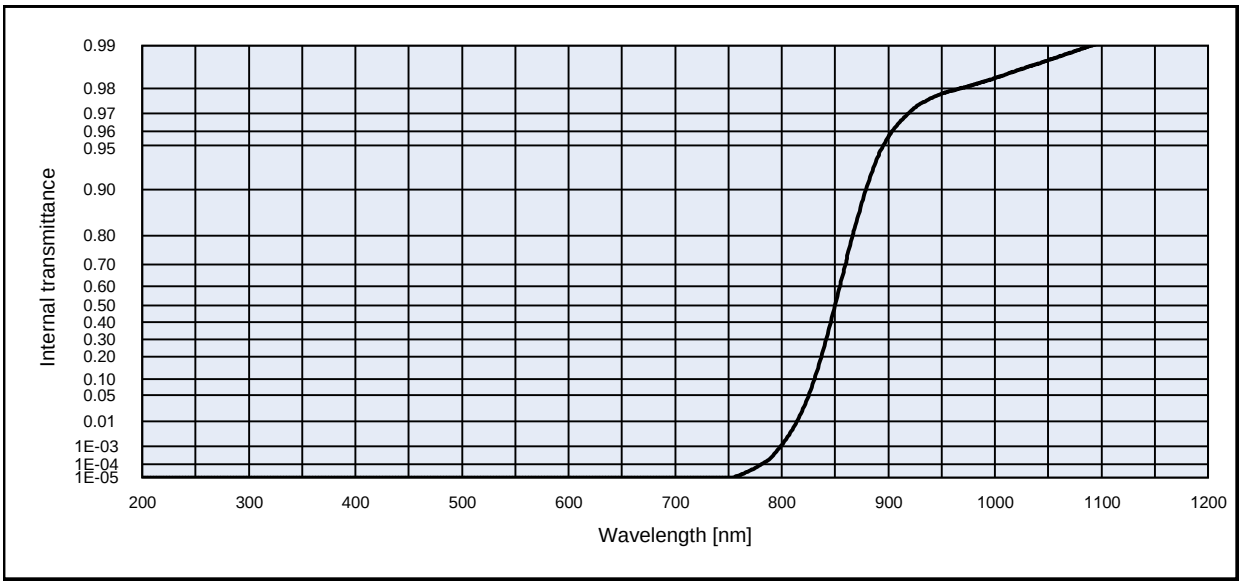
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

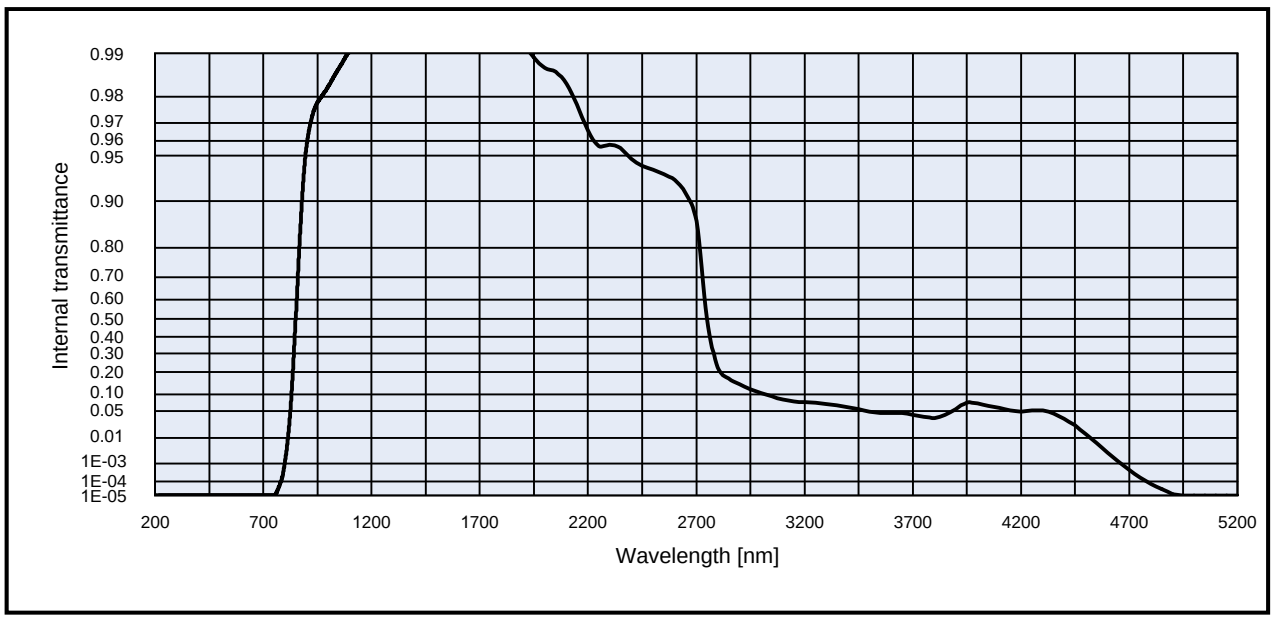
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# RG850




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | < 1.0E-05 | 800 | 1.2E-03 | 1100 | 9.9E-01 | 2200 | 9.7E-01 | 3700 | 4.2E-02 |
| 210 | < 1.0E-05 | 510 | < 1.0E-05 | 810 | 5.3E-03 | 1110 | 9.9E-01 | 2250 | 9.6E-01 | 3750 | 3.7E-02 |
| 220 | < 1.0E-05 | 520 | < 1.0E-05 | 820 | 2.4E-02 | 1120 | 9.9E-01 | 2300 | 9.6E-01 | 3800 | 3.5E-02 |
| 230 | < 1.0E-05 | 530 | < 1.0E-05 | 830 | 9.1E-02 | 1130 | 9.9E-01 | 2350 | 9.6E-01 | 3850 | 4.2E-02 |
| 240 | < 1.0E-05 | 540 | < 1.0E-05 | 840 | 2.6E-01 | 1140 | 9.9E-01 | 2400 | 9.5E-01 | 3900 | 5.5E-02 |
| 250 | < 1.0E-05 | 550 | < 1.0E-05 | 850 | 5.0E-01 | 1150 | 9.9E-01 | 2450 | 9.4E-01 | 3950 | 7.2E-02 |
| 260 | < 1.0E-05 | 560 | < 1.0E-05 | 860 | 7.0E-01 | 1160 | 9.9E-01 | 2500 | 9.4E-01 | 4000 | 7.1E-02 |
| 270 | < 1.0E-05 | 570 | < 1.0E-05 | 870 | 8.4E-01 | 1170 | 9.9E-01 | 2550 | 9.3E-01 | 4050 | 6.3E-02 |
| 280 | < 1.0E-05 | 580 | < 1.0E-05 | 880 | 9.1E-01 | 1180 | 9.9E-01 | 2600 | 9.3E-01 | 4100 | 5.7E-02 |
| 290 | < 1.0E-05 | 590 | < 1.0E-05 | 890 | 9.4E-01 | 1190 | 9.9E-01 | 2650 | 9.1E-01 | 4150 | 5.2E-02 |
| 300 | < 1.0E-05 | 600 | < 1.0E-05 | 900 | 9.6E-01 | 1200 | 9.9E-01 | 2700 | 8.6E-01 | 4200 | 4.9E-02 |
| 310 | < 1.0E-05 | 610 | < 1.0E-05 | 910 | 9.7E-01 | 1250 | 1.0E+00 | 2750 | 5.1E-01 | 4250 | 5.2E-02 |
| 320 | < 1.0E-05 | 620 | < 1.0E-05 | 920 | 9.7E-01 | 1300 | 1.0E+00 | 2800 | 2.2E-01 | 4300 | 5.1E-02 |
| 330 | < 1.0E-05 | 630 | < 1.0E-05 | 930 | 9.7E-01 | 1350 | 1.0E+00 | 2850 | 1.7E-01 | 4350 | 4.4E-02 |
| 340 | < 1.0E-05 | 640 | < 1.0E-05 | 940 | 9.8E-01 | 1400 | 1.0E+00 | 2900 | 1.4E-01 | 4400 | 3.3E-02 |
| 350 | < 1.0E-05 | 650 | < 1.0E-05 | 950 | 9.8E-01 | 1450 | 1.0E+00 | 2950 | 1.2E-01 | 4450 | 2.3E-02 |
| 360 | < 1.0E-05 | 660 | < 1.0E-05 | 960 | 9.8E-01 | 1500 | 1.0E+00 | 3000 | 1.0E-01 | 4500 | 1.3E-02 |
| 370 | < 1.0E-05 | 670 | < 1.0E-05 | 970 | 9.8E-01 | 1550 | 1.0E+00 | 3050 | 9.3E-02 | 4550 | 6.8E-03 |
| 380 | < 1.0E-05 | 680 | < 1.0E-05 | 980 | 9.8E-01 | 1600 | 1.0E+00 | 3100 | 8.3E-02 | 4600 | 3.0E-03 |
| 390 | < 1.0E-05 | 690 | < 1.0E-05 | 990 | 9.8E-01 | 1650 | 1.0E+00 | 3150 | 7.7E-02 | 4650 | 1.2E-03 |
| 400 | < 1.0E-05 | 700 | < 1.0E-05 | 1000 | 9.8E-01 | 1700 | 1.0E+00 | 3200 | 7.4E-02 | 4700 | 4.7E-04 |
| 410 | < 1.0E-05 | 710 | < 1.0E-05 | 1010 | 9.8E-01 | 1750 | 9.9E-01 | 3250 | 7.2E-02 | 4750 | 1.8E-04 |
| 420 | < 1.0E-05 | 720 | < 1.0E-05 | 1020 | 9.8E-01 | 1800 | 9.9E-01 | 3300 | 6.8E-02 | 4800 | 7.2E-05 |
| 430 | < 1.0E-05 | 730 | < 1.0E-05 | 1030 | 9.9E-01 | 1850 | 9.9E-01 | 3350 | 6.4E-02 | 4850 | 3.0E-05 |
| 440 | < 1.0E-05 | 740 | < 1.0E-05 | 1040 | 9.9E-01 | 1900 | 9.9E-01 | 3400 | 5.9E-02 | 4900 | 1.3E-05 |
| 450 | < 1.0E-05 | 750 | < 1.0E-05 | 1050 | 9.9E-01 | 1950 | 9.9E-01 | 3450 | 5.4E-02 | 4950 | < 1.0E-05 |
| 460 | < 1.0E-05 | 760 | 1.5E-05 | 1060 | 9.9E-01 | 2000 | 9.9E-01 | 3500 | 4.9E-02 | 5000 | < 1.0E-05 |
| 470 | < 1.0E-05 | 770 | 3.4E-05 | 1070 | 9.9E-01 | 2050 | 9.9E-01 | 3550 | 4.5E-02 | 5050 | < 1.0E-05 |
| 480 | < 1.0E-05 | 780 | 8.5E-05 | 1080 | 9.9E-01 | 2100 | 9.8E-01 | 3600 | 4.5E-02 | 5100 | < 1.0E-05 |
| 490 | < 1.0E-05 | 790 | 2.4E-04 | 1090 | 9.9E-01 | 2150 | 9.8E-01 | 3650 | 4.5E-02 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## RG1000

| Reflection factor | |
|---|---|
| $P_d$ | 0.91 |

| Reference thickness | |
|---|---|
| d [mm] | 3 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| λc (τi = 0.50) [nm] | = | 1000 | ± 6 |
| λs (τis = 1·10-5) [nm] | = | 730 | |
| λp (τip = 0.90) [nm] | = | 1300 | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.54 |
| 852.1 | Cs | 1.53 |
| 1014 | Hg | 1.53 |

| Density | |
|---|---|
| ρ [g/cm³] | 2.73 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 476 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 9.0 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 10.3 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | 0.41 |

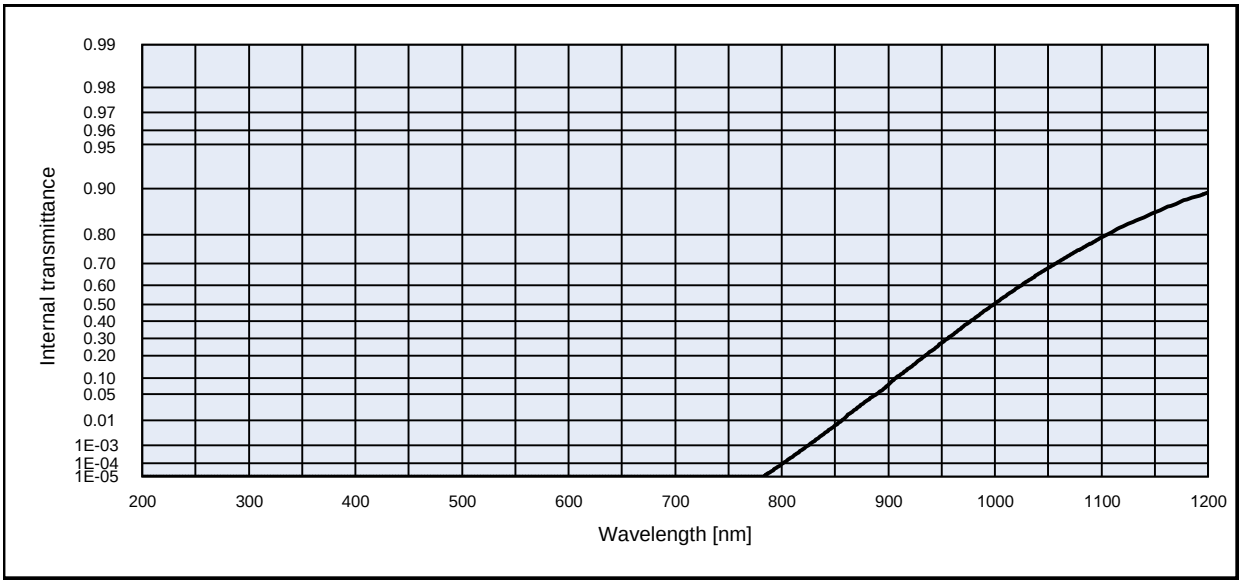
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Long pass filter |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

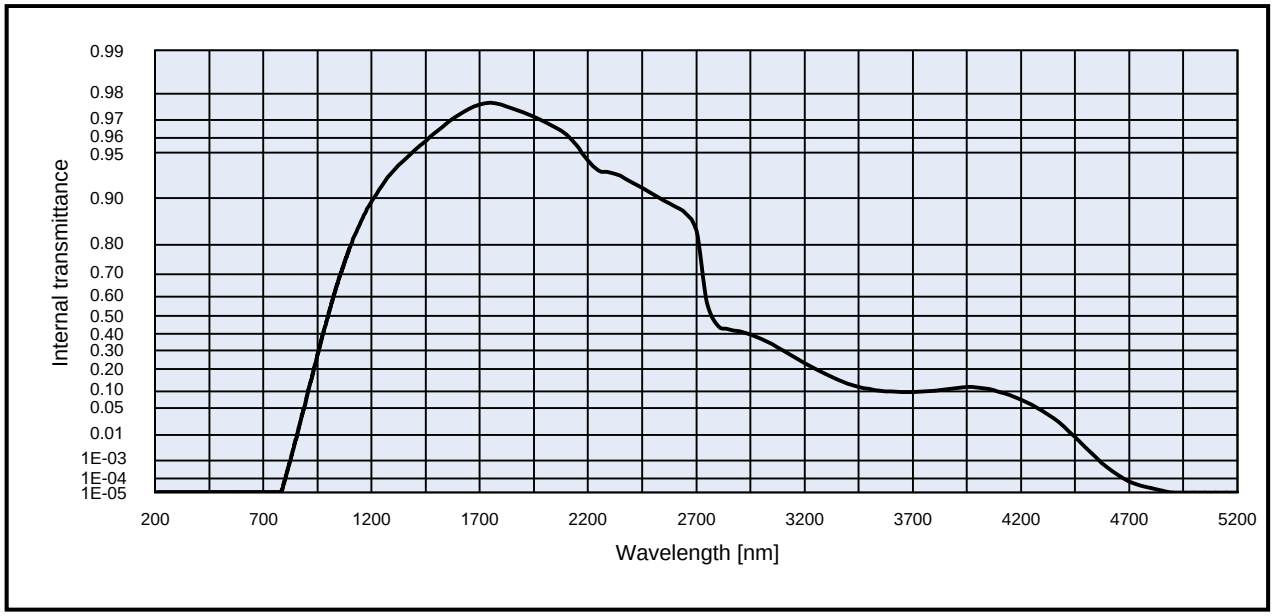
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# RG1000




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 3**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | < 1.0E-05 | 800 | 8.4E-05 | 1100 | 7.9E-01 | 2200 | 9.4E-01 | 3700 | 9.8E-02 |
| 210 | < 1.0E-05 | 510 | < 1.0E-05 | 810 | 2.5E-04 | 1110 | 8.1E-01 | 2250 | 9.3E-01 | 3750 | 1.0E-01 |
| 220 | < 1.0E-05 | 520 | < 1.0E-05 | 820 | 6.5E-04 | 1120 | 8.2E-01 | 2300 | 9.3E-01 | 3800 | 1.0E-01 |
| 230 | < 1.0E-05 | 530 | < 1.0E-05 | 830 | 1.6E-03 | 1130 | 8.4E-01 | 2350 | 9.3E-01 | 3850 | 1.1E-01 |
| 240 | < 1.0E-05 | 540 | < 1.0E-05 | 840 | 3.4E-03 | 1140 | 8.5E-01 | 2400 | 9.2E-01 | 3900 | 1.1E-01 |
| 250 | < 1.0E-05 | 550 | < 1.0E-05 | 850 | 6.8E-03 | 1150 | 8.6E-01 | 2450 | 9.1E-01 | 3950 | 1.2E-01 |
| 260 | < 1.0E-05 | 560 | < 1.0E-05 | 860 | 1.3E-02 | 1160 | 8.7E-01 | 2500 | 9.1E-01 | 4000 | 1.2E-01 |
| 270 | < 1.0E-05 | 570 | < 1.0E-05 | 870 | 2.2E-02 | 1170 | 8.7E-01 | 2550 | 9.0E-01 | 4050 | 1.1E-01 |
| 280 | < 1.0E-05 | 580 | < 1.0E-05 | 880 | 3.6E-02 | 1180 | 8.8E-01 | 2600 | 8.9E-01 | 4100 | 9.8E-02 |
| 290 | < 1.0E-05 | 590 | < 1.0E-05 | 890 | 5.2E-02 | 1190 | 8.9E-01 | 2650 | 8.7E-01 | 4150 | 8.6E-02 |
| 300 | < 1.0E-05 | 600 | < 1.0E-05 | 900 | 7.7E-02 | 1200 | 8.9E-01 | 2700 | 8.4E-01 | 4200 | 7.2E-02 |
| 310 | < 1.0E-05 | 610 | < 1.0E-05 | 910 | 1.1E-01 | 1250 | 9.2E-01 | 2750 | 5.7E-01 | 4250 | 5.9E-02 |
| 320 | < 1.0E-05 | 620 | < 1.0E-05 | 920 | 1.4E-01 | 1300 | 9.3E-01 | 2800 | 4.5E-01 | 4300 | 4.3E-02 |
| 330 | < 1.0E-05 | 630 | < 1.0E-05 | 930 | 1.8E-01 | 1350 | 9.4E-01 | 2850 | 4.2E-01 | 4350 | 2.9E-02 |
| 340 | < 1.0E-05 | 640 | < 1.0E-05 | 940 | 2.2E-01 | 1400 | 9.5E-01 | 2900 | 4.1E-01 | 4400 | 1.8E-02 |
| 350 | < 1.0E-05 | 650 | < 1.0E-05 | 950 | 2.7E-01 | 1450 | 9.6E-01 | 2950 | 3.9E-01 | 4450 | 8.5E-03 |
| 360 | < 1.0E-05 | 660 | < 1.0E-05 | 960 | 3.2E-01 | 1500 | 9.6E-01 | 3000 | 3.7E-01 | 4500 | 3.5E-03 |
| 370 | < 1.0E-05 | 670 | < 1.0E-05 | 970 | 3.7E-01 | 1550 | 9.7E-01 | 3050 | 3.4E-01 | 4550 | 1.3E-03 |
| 380 | < 1.0E-05 | 680 | < 1.0E-05 | 980 | 4.1E-01 | 1600 | 9.7E-01 | 3100 | 3.0E-01 | 4600 | 4.4E-04 |
| 390 | < 1.0E-05 | 690 | < 1.0E-05 | 990 | 4.6E-01 | 1650 | 9.7E-01 | 3150 | 2.6E-01 | 4650 | 1.6E-04 |
| 400 | < 1.0E-05 | 700 | < 1.0E-05 | 1000 | 5.0E-01 | 1700 | 9.8E-01 | 3200 | 2.3E-01 | 4700 | 6.4E-05 |
| 410 | < 1.0E-05 | 710 | < 1.0E-05 | 1010 | 5.5E-01 | 1750 | 9.8E-01 | 3250 | 2.0E-01 | 4750 | 3.4E-05 |
| 420 | < 1.0E-05 | 720 | < 1.0E-05 | 1020 | 5.8E-01 | 1800 | 9.8E-01 | 3300 | 1.8E-01 | 4800 | 2.2E-05 |
| 430 | < 1.0E-05 | 730 | < 1.0E-05 | 1030 | 6.2E-01 | 1850 | 9.7E-01 | 3350 | 1.5E-01 | 4850 | 1.4E-05 |
| 440 | < 1.0E-05 | 740 | < 1.0E-05 | 1040 | 6.5E-01 | 1900 | 9.7E-01 | 3400 | 1.3E-01 | 4900 | < 1.0E-05 |
| 450 | < 1.0E-05 | 750 | < 1.0E-05 | 1050 | 6.8E-01 | 1950 | 9.7E-01 | 3450 | 1.2E-01 | 4950 | < 1.0E-05 |
| 460 | < 1.0E-05 | 760 | < 1.0E-05 | 1060 | 7.1E-01 | 2000 | 9.7E-01 | 3500 | 1.1E-01 | 5000 | < 1.0E-05 |
| 470 | < 1.0E-05 | 770 | < 1.0E-05 | 1070 | 7.3E-01 | 2050 | 9.7E-01 | 3550 | 1.0E-01 | 5050 | < 1.0E-05 |
| 480 | < 1.0E-05 | 780 | < 1.0E-05 | 1080 | 7.5E-01 | 2100 | 9.6E-01 | 3600 | 9.9E-02 | 5100 | < 1.0E-05 |
| 490 | < 1.0E-05 | 790 | 2.6E-05 | 1090 | 7.7E-01 | 2150 | 9.6E-01 | 3650 | 9.8E-02 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## BG36

| Density | |
|---|---|
| ρ [g/cm³] | 3.59 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.88 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Chemical resistance | |
|---|---|
| FR class | 1 |
| SR class | 52.2 |
| AR class | 1.2 |

| Spectral values guaranteed |
|---|
| |

| Transformation temperature | |
|---|---|
| Tg [°C] | 657 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 6.1 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 7.2 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 588 | He | 1.69 |
| | | |
| | | |
| | | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |
| | |
| | |
| | |
| | |

| Notes |
|---|
| |
| Ionically colored glass |
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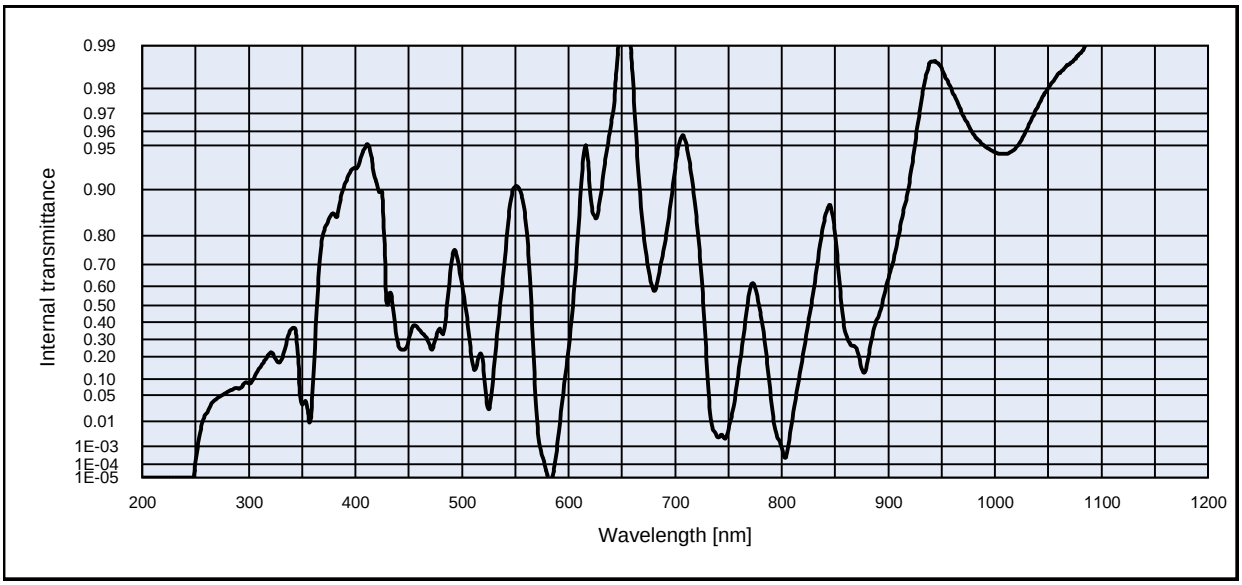
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

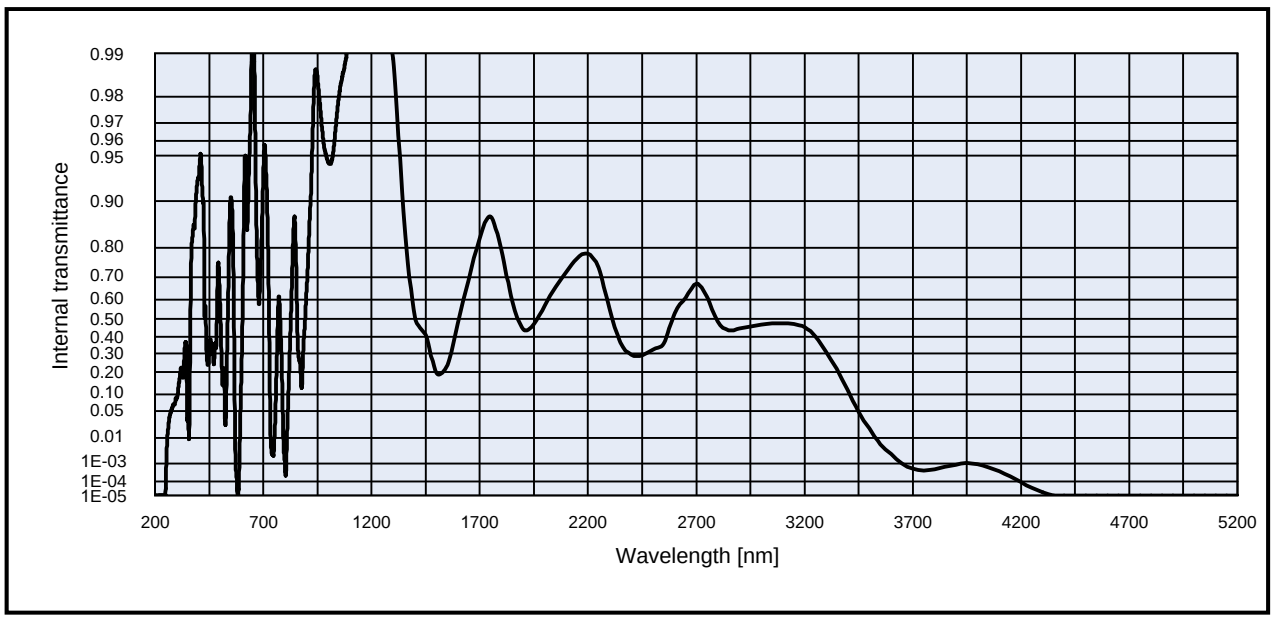
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.495 | 0.534 | 0.557 |
| y | 0.387 | 0.390 | 0.389 |
| Y | 41 | 32 | 27 |
| $\lambda_d$ [nm] | 628 | 600 | 599 |
| $P_e$ | 0.19 | 0.48 | 0.63 |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.469 | 0.512 | 0.537 |
| y | 0.382 | 0.390 | 0.391 |
| Y | 41 | 31 | 26 |
| $\lambda_d$ [nm] | 629 | 599 | 597 |
| $P_e$ | 0.16 | 0.44 | 0.59 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.344 | 0.395 | 0.429 |
| y | 0.327 | 0.356 | 0.370 |
| Y | 39 | 29 | 23 |
| $\lambda_d$ [nm] | 622 | 591 | 590 |
| $P_e$ | 0.08 | 0.30 | 0.44 |



# BG36




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 6.1E-01 | 800 | 8.6E-04 | 1100 | 9.9E-01 | 2200 | 7.8E-01 | 3700 | 5.6E-04 |
| 210 | < 1.0E-05 | 510 | 1.7E-01 | 810 | 1.2E-02 | 1110 | 1.0E+00 | 2250 | 7.4E-01 | 3750 | 4.5E-04 |
| 220 | < 1.0E-05 | 520 | 1.6E-01 | 820 | 2.1E-01 | 1120 | 1.0E+00 | 2300 | 5.6E-01 | 3800 | 5.0E-04 |
| 230 | < 1.0E-05 | 530 | 1.4E-01 | 830 | 5.8E-01 | 1130 | 1.0E+00 | 2350 | 3.6E-01 | 3850 | 6.8E-04 |
| 240 | < 1.0E-05 | 540 | 7.1E-01 | 840 | 8.4E-01 | 1140 | 1.0E+00 | 2400 | 2.9E-01 | 3900 | 8.9E-04 |
| 250 | 1.3E-04 | 550 | 9.0E-01 | 850 | 8.1E-01 | 1150 | 1.0E+00 | 2450 | 2.9E-01 | 3950 | 1.1E-03 |
| 260 | 1.7E-02 | 560 | 8.4E-01 | 860 | 3.3E-01 | 1160 | 1.0E+00 | 2500 | 3.2E-01 | 4000 | 9.3E-04 |
| 270 | 4.2E-02 | 570 | 1.9E-02 | 870 | 2.5E-01 | 1170 | 1.0E+00 | 2550 | 3.6E-01 | 4050 | 6.5E-04 |
| 280 | 5.8E-02 | 580 | 1.6E-05 | 880 | 1.6E-01 | 1180 | 1.0E+00 | 2600 | 5.3E-01 | 4100 | 4.1E-04 |
| 290 | 6.8E-02 | 590 | 1.8E-03 | 890 | 4.3E-01 | 1190 | 1.0E+00 | 2650 | 6.1E-01 | 4150 | 2.0E-04 |
| 300 | 8.4E-02 | 600 | 2.4E-01 | 900 | 6.4E-01 | 1200 | 9.9E-01 | 2700 | 6.7E-01 | 4200 | 8.9E-05 |
| 310 | 1.4E-01 | 610 | 8.5E-01 | 910 | 8.0E-01 | 1250 | 1.0E+00 | 2750 | 6.2E-01 | 4250 | 3.7E-05 |
| 320 | 2.2E-01 | 620 | 9.0E-01 | 920 | 9.1E-01 | 1300 | 9.9E-01 | 2800 | 4.9E-01 | 4300 | 1.7E-05 |
| 330 | 1.8E-01 | 630 | 8.9E-01 | 930 | 9.7E-01 | 1350 | 8.7E-01 | 2850 | 4.4E-01 | 4350 | < 1.0E-05 |
| 340 | 3.6E-01 | 640 | 9.6E-01 | 940 | 9.9E-01 | 1400 | 5.1E-01 | 2900 | 4.5E-01 | 4400 | < 1.0E-05 |
| 350 | 3.0E-02 | 650 | 1.0E+00 | 950 | 9.9E-01 | 1450 | 4.1E-01 | 2950 | 4.6E-01 | 4450 | < 1.0E-05 |
| 360 | 6.1E-02 | 660 | 9.8E-01 | 960 | 9.8E-01 | 1500 | 1.9E-01 | 3000 | 4.7E-01 | 4500 | < 1.0E-05 |
| 370 | 8.1E-01 | 670 | 8.2E-01 | 970 | 9.7E-01 | 1550 | 2.4E-01 | 3050 | 4.7E-01 | 4550 | < 1.0E-05 |
| 380 | 8.6E-01 | 680 | 5.8E-01 | 980 | 9.6E-01 | 1600 | 4.8E-01 | 3100 | 4.8E-01 | 4600 | < 1.0E-05 |
| 390 | 9.1E-01 | 690 | 7.7E-01 | 990 | 9.5E-01 | 1650 | 6.9E-01 | 3150 | 4.7E-01 | 4650 | < 1.0E-05 |
| 400 | 9.3E-01 | 700 | 9.3E-01 | 1000 | 9.4E-01 | 1700 | 8.2E-01 | 3200 | 4.5E-01 | 4700 | < 1.0E-05 |
| 410 | 9.5E-01 | 710 | 9.5E-01 | 1010 | 9.4E-01 | 1750 | 8.7E-01 | 3250 | 4.0E-01 | 4750 | < 1.0E-05 |
| 420 | 9.1E-01 | 720 | 8.5E-01 | 1020 | 9.5E-01 | 1800 | 8.0E-01 | 3300 | 3.1E-01 | 4800 | < 1.0E-05 |
| 430 | 5.0E-01 | 730 | 1.5E-01 | 1030 | 9.6E-01 | 1850 | 5.9E-01 | 3350 | 2.2E-01 | 4850 | < 1.0E-05 |
| 440 | 2.7E-01 | 740 | 2.6E-03 | 1040 | 9.7E-01 | 1900 | 4.4E-01 | 3400 | 1.2E-01 | 4900 | < 1.0E-05 |
| 450 | 3.0E-01 | 750 | 5.3E-03 | 1050 | 9.8E-01 | 1950 | 4.7E-01 | 3450 | 4.9E-02 | 4950 | < 1.0E-05 |
| 460 | 3.6E-01 | 760 | 1.5E-01 | 1060 | 9.8E-01 | 2000 | 5.7E-01 | 3500 | 2.0E-02 | 5000 | < 1.0E-05 |
| 470 | 2.6E-01 | 770 | 5.8E-01 | 1070 | 9.9E-01 | 2050 | 6.6E-01 | 3550 | 6.3E-03 | 5050 | < 1.0E-05 |
| 480 | 3.5E-01 | 780 | 4.6E-01 | 1080 | 9.9E-01 | 2100 | 7.2E-01 | 3600 | 2.7E-03 | 5100 | < 1.0E-05 |
| 490 | 7.1E-01 | 790 | 4.2E-02 | 1090 | 9.9E-01 | 2150 | 7.7E-01 | 3650 | 1.0E-03 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## NG1

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (546 nm) | < | 1 · 10-4 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.52 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.47 |

| Bubble content | |
|---|---|
| Bubble class | 2 |

| Chemical resistance | |
|---|---|
| FR class | 1 |
| SR class | 2.2 |
| AR class | 1.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 471 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 6.6 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 7.2 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |

| Notes |
|---|
| |
| Ionically colored glass |
| |
| Neutral density filter |
| |
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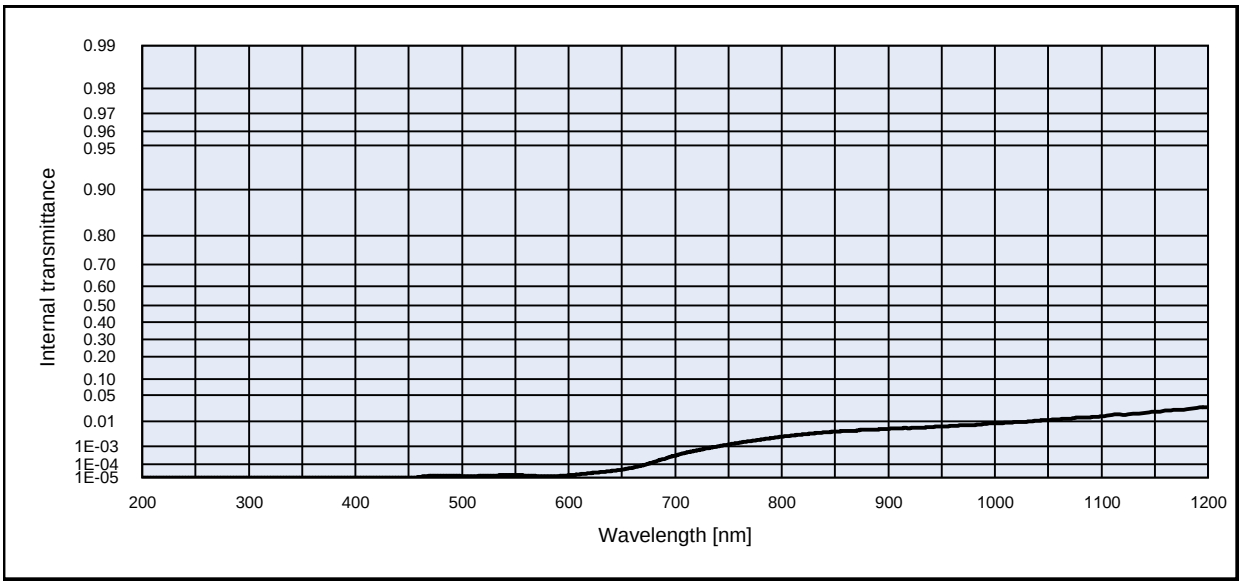
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

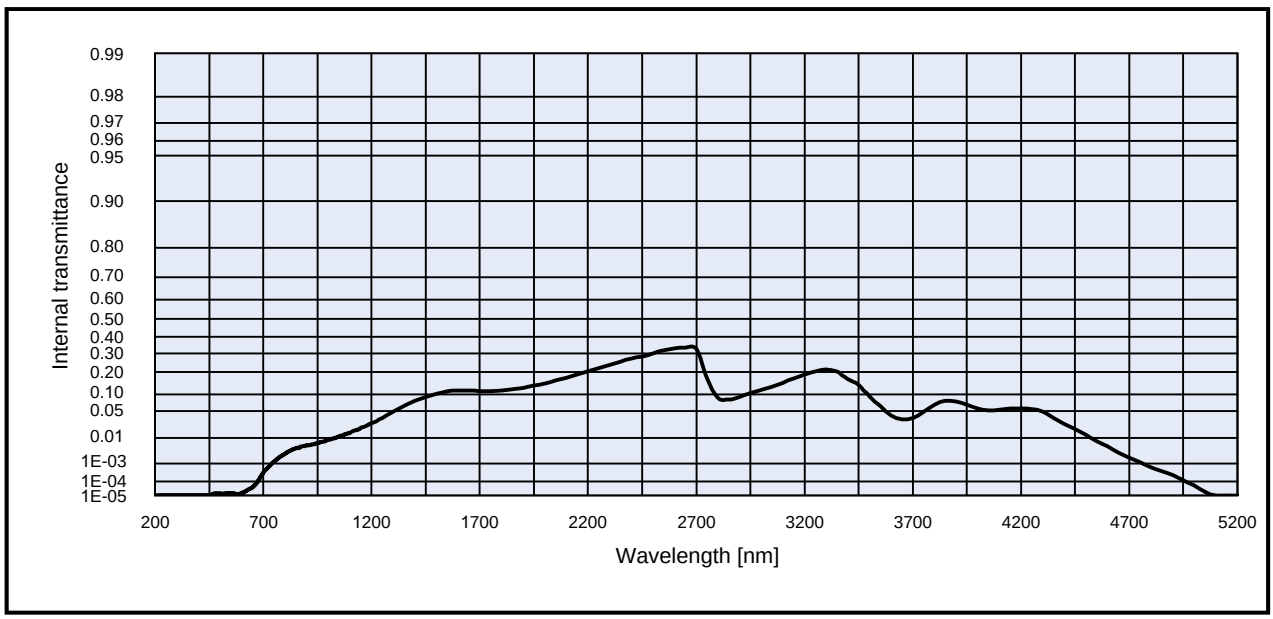
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# NG1




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 1.3E-05 | 800 | 2.7E-03 | 1100 | 1.4E-02 | 2200 | 2.0E-01 | 3700 | 3.6E-02 |
| 210 | < 1.0E-05 | 510 | 1.3E-05 | 810 | 3.0E-03 | 1110 | 1.6E-02 | 2250 | 2.2E-01 | 3750 | 4.8E-02 |
| 220 | < 1.0E-05 | 520 | 1.4E-05 | 820 | 3.4E-03 | 1120 | 1.6E-02 | 2300 | 2.4E-01 | 3800 | 6.6E-02 |
| 230 | < 1.0E-05 | 530 | 1.5E-05 | 830 | 3.7E-03 | 1130 | 1.7E-02 | 2350 | 2.6E-01 | 3850 | 7.7E-02 |
| 240 | < 1.0E-05 | 540 | 1.6E-05 | 840 | 4.1E-03 | 1140 | 1.8E-02 | 2400 | 2.7E-01 | 3900 | 7.6E-02 |
| 250 | < 1.0E-05 | 550 | 1.6E-05 | 850 | 4.3E-03 | 1150 | 2.0E-02 | 2450 | 2.9E-01 | 3950 | 6.7E-02 |
| 260 | < 1.0E-05 | 560 | 1.5E-05 | 860 | 4.6E-03 | 1160 | 2.1E-02 | 2500 | 3.0E-01 | 4000 | 5.6E-02 |
| 270 | < 1.0E-05 | 570 | 1.3E-05 | 870 | 4.8E-03 | 1170 | 2.2E-02 | 2550 | 3.2E-01 | 4050 | 5.1E-02 |
| 280 | < 1.0E-05 | 580 | 1.3E-05 | 880 | 5.2E-03 | 1180 | 2.3E-02 | 2600 | 3.3E-01 | 4100 | 5.3E-02 |
| 290 | < 1.0E-05 | 590 | 1.3E-05 | 890 | 5.2E-03 | 1190 | 2.4E-02 | 2650 | 3.4E-01 | 4150 | 5.6E-02 |
| 300 | < 1.0E-05 | 600 | 1.5E-05 | 900 | 5.5E-03 | 1200 | 2.6E-02 | 2700 | 3.3E-01 | 4200 | 5.7E-02 |
| 310 | < 1.0E-05 | 610 | 1.8E-05 | 910 | 5.7E-03 | 1250 | 3.5E-02 | 2750 | 1.7E-01 | 4250 | 5.5E-02 |
| 320 | < 1.0E-05 | 620 | 2.2E-05 | 920 | 5.9E-03 | 1300 | 4.8E-02 | 2800 | 8.9E-02 | 4300 | 4.8E-02 |
| 330 | < 1.0E-05 | 630 | 2.7E-05 | 930 | 6.0E-03 | 1350 | 6.2E-02 | 2850 | 8.2E-02 | 4350 | 3.5E-02 |
| 340 | < 1.0E-05 | 640 | 3.3E-05 | 940 | 6.5E-03 | 1400 | 7.8E-02 | 2900 | 9.2E-02 | 4400 | 2.6E-02 |
| 350 | < 1.0E-05 | 650 | 4.1E-05 | 950 | 6.7E-03 | 1450 | 9.2E-02 | 2950 | 1.0E-01 | 4450 | 1.9E-02 |
| 360 | < 1.0E-05 | 660 | 5.6E-05 | 960 | 7.1E-03 | 1500 | 1.0E-01 | 3000 | 1.2E-01 | 4500 | 1.3E-02 |
| 370 | < 1.0E-05 | 670 | 8.3E-05 | 970 | 7.6E-03 | 1550 | 1.1E-01 | 3050 | 1.3E-01 | 4550 | 7.8E-03 |
| 380 | < 1.0E-05 | 680 | 1.3E-04 | 980 | 7.6E-03 | 1600 | 1.2E-01 | 3100 | 1.5E-01 | 4600 | 5.1E-03 |
| 390 | < 1.0E-05 | 690 | 2.1E-04 | 990 | 8.2E-03 | 1650 | 1.1E-01 | 3150 | 1.7E-01 | 4650 | 3.0E-03 |
| 400 | < 1.0E-05 | 700 | 3.2E-04 | 1000 | 8.6E-03 | 1700 | 1.1E-01 | 3200 | 1.9E-01 | 4700 | 1.8E-03 |
| 410 | < 1.0E-05 | 710 | 4.6E-04 | 1010 | 9.1E-03 | 1750 | 1.1E-01 | 3250 | 2.0E-01 | 4750 | 1.1E-03 |
| 420 | < 1.0E-05 | 720 | 6.2E-04 | 1020 | 9.6E-03 | 1800 | 1.2E-01 | 3300 | 2.1E-01 | 4800 | 6.3E-04 |
| 430 | < 1.0E-05 | 730 | 8.0E-04 | 1030 | 9.8E-03 | 1850 | 1.2E-01 | 3350 | 2.0E-01 | 4850 | 4.2E-04 |
| 440 | < 1.0E-05 | 740 | 9.9E-04 | 1040 | 1.1E-02 | 1900 | 1.3E-01 | 3400 | 1.7E-01 | 4900 | 2.5E-04 |
| 450 | < 1.0E-05 | 750 | 1.2E-03 | 1050 | 1.1E-02 | 1950 | 1.3E-01 | 3450 | 1.4E-01 | 4950 | 1.2E-04 |
| 460 | 1.1E-05 | 760 | 1.5E-03 | 1060 | 1.2E-02 | 2000 | 1.5E-01 | 3500 | 9.4E-02 | 5000 | 5.5E-05 |
| 470 | 1.4E-05 | 770 | 1.7E-03 | 1070 | 1.2E-02 | 2050 | 1.6E-01 | 3550 | 6.3E-02 | 5050 | 2.0E-05 |
| 480 | 1.4E-05 | 780 | 2.0E-03 | 1080 | 1.3E-02 | 2100 | 1.7E-01 | 3600 | 4.0E-02 | 5100 | < 1.0E-05 |
| 490 | 1.4E-05 | 790 | 2.4E-03 | 1090 | 1.4E-02 | 2150 | 1.9E-01 | 3650 | 3.3E-02 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## NG3

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| τi (405 nm) | = | 0.06 | ± 0.02 |
| τi (546 nm) | = | 0.10 | ± 0.02 |
| τi (694 nm) | = | 0.17 | ± 0.03 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.51 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.44 |

| Bubble content | |
|---|---|
| Bubble class | 2 |

| Chemical resistance | |
|---|---|
| FR class | 1 |
| SR class | 2.2 |
| AR class | 1.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 462 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 6.5 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 7.3 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |

| Notes |
|---|
| |
| Ionically colored glass |
| |
| Neutral density filter |

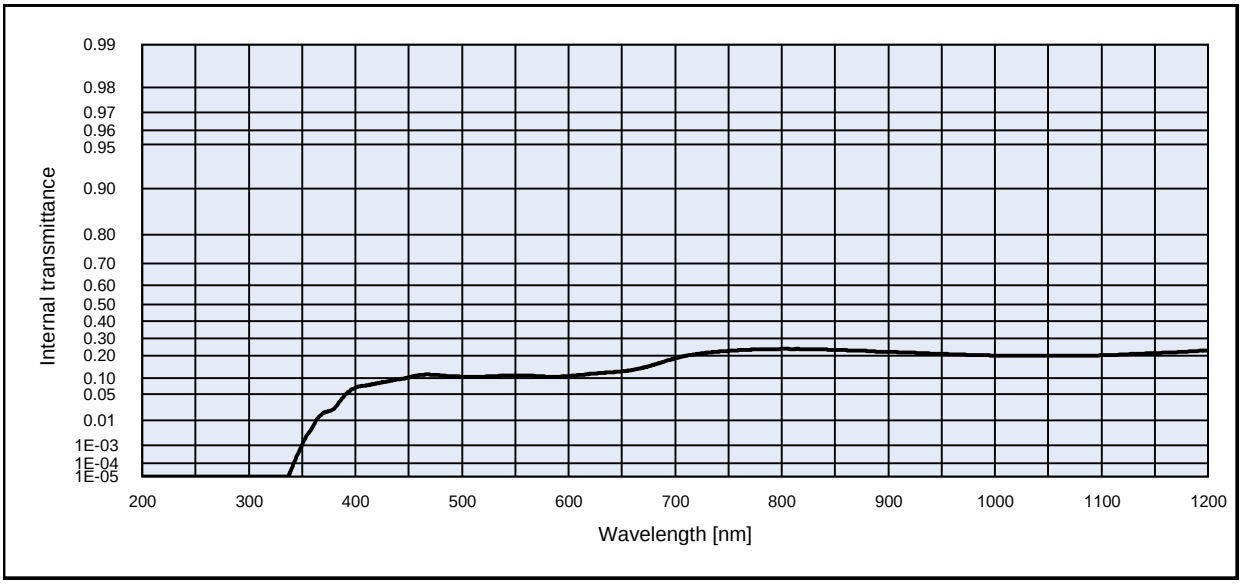
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

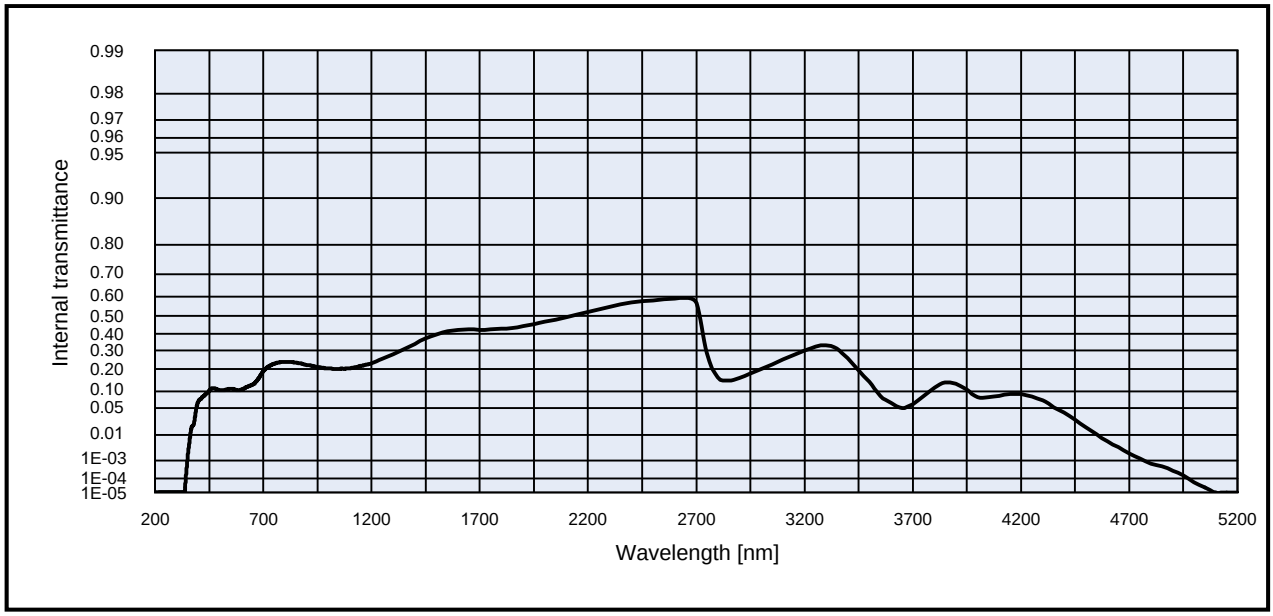
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# NG3




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 1.0E-01 | 800 | 2.4E-01 | 1100 | 2.0E-01 | 2200 | 5.2E-01 | 3700 | 6.0E-02 |
| 210 | < 1.0E-05 | 510 | 1.0E-01 | 810 | 2.4E-01 | 1110 | 2.1E-01 | 2250 | 5.4E-01 | 3750 | 8.5E-02 |
| 220 | < 1.0E-05 | 520 | 1.0E-01 | 820 | 2.4E-01 | 1120 | 2.1E-01 | 2300 | 5.5E-01 | 3800 | 1.2E-01 |
| 230 | < 1.0E-05 | 530 | 1.1E-01 | 830 | 2.4E-01 | 1130 | 2.1E-01 | 2350 | 5.6E-01 | 3850 | 1.4E-01 |
| 240 | < 1.0E-05 | 540 | 1.1E-01 | 840 | 2.4E-01 | 1140 | 2.1E-01 | 2400 | 5.7E-01 | 3900 | 1.3E-01 |
| 250 | < 1.0E-05 | 550 | 1.1E-01 | 850 | 2.3E-01 | 1150 | 2.1E-01 | 2450 | 5.8E-01 | 3950 | 1.1E-01 |
| 260 | < 1.0E-05 | 560 | 1.1E-01 | 860 | 2.3E-01 | 1160 | 2.2E-01 | 2500 | 5.8E-01 | 4000 | 8.0E-02 |
| 270 | < 1.0E-05 | 570 | 1.1E-01 | 870 | 2.3E-01 | 1170 | 2.2E-01 | 2550 | 5.9E-01 | 4050 | 8.0E-02 |
| 280 | < 1.0E-05 | 580 | 1.1E-01 | 880 | 2.3E-01 | 1180 | 2.2E-01 | 2600 | 5.9E-01 | 4100 | 8.5E-02 |
| 290 | < 1.0E-05 | 590 | 1.0E-01 | 890 | 2.2E-01 | 1190 | 2.3E-01 | 2650 | 6.0E-01 | 4150 | 9.0E-02 |
| 300 | < 1.0E-05 | 600 | 1.1E-01 | 900 | 2.2E-01 | 1200 | 2.3E-01 | 2700 | 5.7E-01 | 4200 | 9.0E-02 |
| 310 | < 1.0E-05 | 610 | 1.1E-01 | 910 | 2.2E-01 | 1250 | 2.5E-01 | 2750 | 2.9E-01 | 4250 | 8.3E-02 |
| 320 | < 1.0E-05 | 620 | 1.2E-01 | 920 | 2.2E-01 | 1300 | 2.8E-01 | 2800 | 1.6E-01 | 4300 | 7.0E-02 |
| 330 | < 1.0E-05 | 630 | 1.2E-01 | 930 | 2.2E-01 | 1350 | 3.1E-01 | 2850 | 1.4E-01 | 4350 | 5.2E-02 |
| 340 | 3.9E-05 | 640 | 1.2E-01 | 940 | 2.1E-01 | 1400 | 3.4E-01 | 2900 | 1.6E-01 | 4400 | 4.0E-02 |
| 350 | 1.0E-03 | 650 | 1.3E-01 | 950 | 2.1E-01 | 1450 | 3.7E-01 | 2950 | 1.8E-01 | 4450 | 2.7E-02 |
| 360 | 5.9E-03 | 660 | 1.3E-01 | 960 | 2.1E-01 | 1500 | 4.0E-01 | 3000 | 2.0E-01 | 4500 | 1.7E-02 |
| 370 | 1.7E-02 | 670 | 1.4E-01 | 970 | 2.1E-01 | 1550 | 4.1E-01 | 3050 | 2.2E-01 | 4550 | 1.0E-02 |
| 380 | 2.2E-02 | 680 | 1.6E-01 | 980 | 2.0E-01 | 1600 | 4.2E-01 | 3100 | 2.5E-01 | 4600 | 6.2E-03 |
| 390 | 4.7E-02 | 690 | 1.7E-01 | 990 | 2.0E-01 | 1650 | 4.2E-01 | 3150 | 2.8E-01 | 4650 | 3.7E-03 |
| 400 | 6.7E-02 | 700 | 1.9E-01 | 1000 | 2.0E-01 | 1700 | 4.2E-01 | 3200 | 3.0E-01 | 4700 | 2.1E-03 |
| 410 | 7.4E-02 | 710 | 2.0E-01 | 1010 | 2.0E-01 | 1750 | 4.2E-01 | 3250 | 3.2E-01 | 4750 | 1.2E-03 |
| 420 | 8.1E-02 | 720 | 2.1E-01 | 1020 | 2.0E-01 | 1800 | 4.3E-01 | 3300 | 3.3E-01 | 4800 | 7.1E-04 |
| 430 | 8.7E-02 | 730 | 2.2E-01 | 1030 | 2.0E-01 | 1850 | 4.3E-01 | 3350 | 3.1E-01 | 4850 | 5.2E-04 |
| 440 | 9.5E-02 | 740 | 2.2E-01 | 1040 | 2.0E-01 | 1900 | 4.4E-01 | 3400 | 2.6E-01 | 4900 | 3.0E-04 |
| 450 | 1.0E-01 | 750 | 2.3E-01 | 1050 | 2.0E-01 | 1950 | 4.5E-01 | 3450 | 1.9E-01 | 4950 | 1.5E-04 |
| 460 | 1.1E-01 | 760 | 2.3E-01 | 1060 | 2.0E-01 | 2000 | 4.7E-01 | 3500 | 1.4E-01 | 5000 | 5.6E-05 |
| 470 | 1.1E-01 | 770 | 2.3E-01 | 1070 | 2.0E-01 | 2050 | 4.8E-01 | 3550 | 8.5E-02 | 5050 | 2.5E-05 |
| 480 | 1.1E-01 | 780 | 2.4E-01 | 1080 | 2.0E-01 | 2100 | 5.0E-01 | 3600 | 6.2E-02 | 5100 | < 1.0E-05 |
| 490 | 1.1E-01 | 790 | 2.4E-01 | 1090 | 2.0E-01 | 2150 | 5.1E-01 | 3650 | 5.0E-02 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## NG4

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| τi (405 nm) | = | 0.27 | ± 0.03 |
| τi (546 nm) | = | 0.31 | ± 0.03 |
| τi (694 nm) | = | 0.39 | ± 0.04 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.51 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.43 |

| Bubble content | |
|---|---|
| Bubble class | 2 |

| Chemical resistance | |
|---|---|
| FR class | 1 |
| SR class | 2.2 |
| AR class | 1.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 483 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 6.7 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 7.2 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |

| Notes |
|---|
| |
| Ionically colored glass |
| |
| Neutral density filter |
| |
| |
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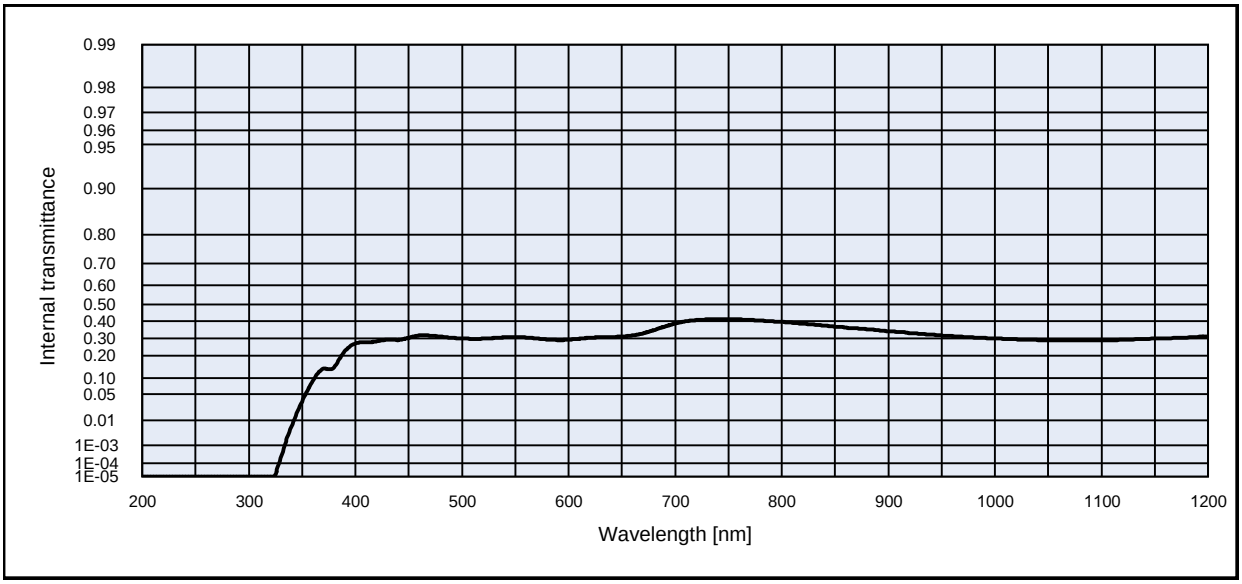
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

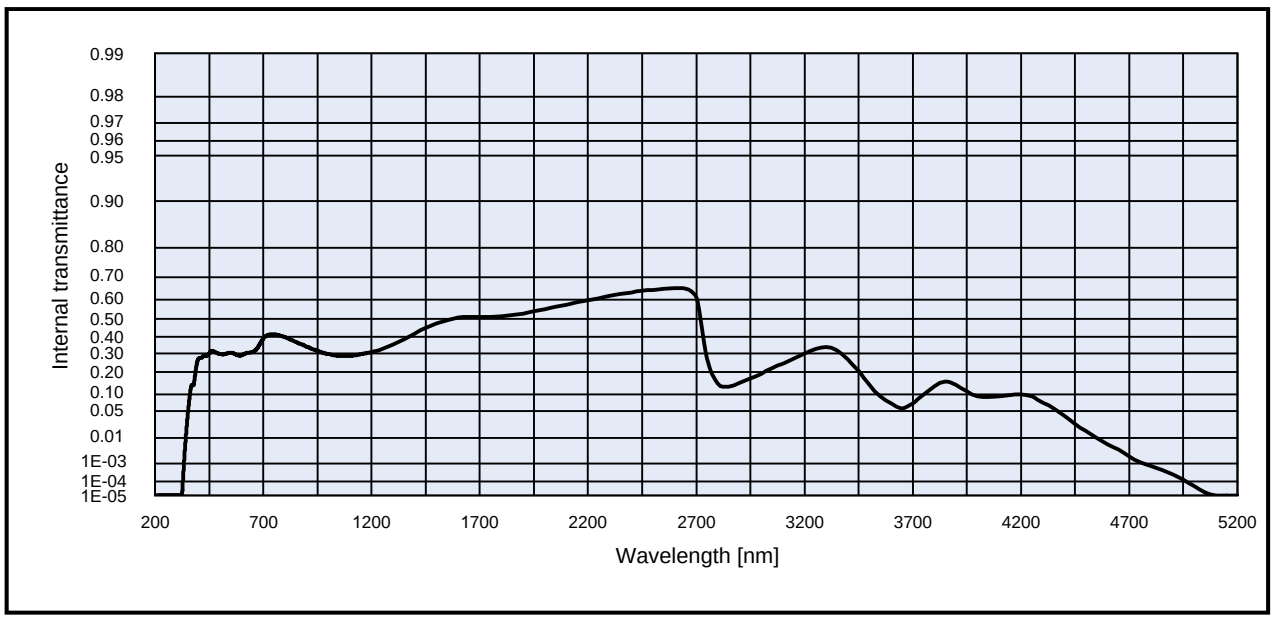
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# NG4




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 3.0E-01 | 800 | 4.0E-01 | 1100 | 2.9E-01 | 2200 | 6.0E-01 | 3700 | 7.0E-02 |
| 210 | < 1.0E-05 | 510 | 3.0E-01 | 810 | 3.9E-01 | 1110 | 2.9E-01 | 2250 | 6.1E-01 | 3750 | 1.0E-01 |
| 220 | < 1.0E-05 | 520 | 3.0E-01 | 820 | 3.9E-01 | 1120 | 2.9E-01 | 2300 | 6.2E-01 | 3800 | 1.3E-01 |
| 230 | < 1.0E-05 | 530 | 3.0E-01 | 830 | 3.8E-01 | 1130 | 2.9E-01 | 2350 | 6.3E-01 | 3850 | 1.5E-01 |
| 240 | < 1.0E-05 | 540 | 3.0E-01 | 840 | 3.7E-01 | 1140 | 2.9E-01 | 2400 | 6.4E-01 | 3900 | 1.4E-01 |
| 250 | < 1.0E-05 | 550 | 3.1E-01 | 850 | 3.7E-01 | 1150 | 3.0E-01 | 2450 | 6.4E-01 | 3950 | 1.1E-01 |
| 260 | < 1.0E-05 | 560 | 3.0E-01 | 860 | 3.6E-01 | 1160 | 3.0E-01 | 2500 | 6.5E-01 | 4000 | 9.4E-02 |
| 270 | < 1.0E-05 | 570 | 3.0E-01 | 870 | 3.6E-01 | 1170 | 3.0E-01 | 2550 | 6.5E-01 | 4050 | 9.0E-02 |
| 280 | < 1.0E-05 | 580 | 2.9E-01 | 880 | 3.5E-01 | 1180 | 3.0E-01 | 2600 | 6.5E-01 | 4100 | 9.4E-02 |
| 290 | < 1.0E-05 | 590 | 2.9E-01 | 890 | 3.5E-01 | 1190 | 3.1E-01 | 2650 | 6.5E-01 | 4150 | 9.8E-02 |
| 300 | < 1.0E-05 | 600 | 2.9E-01 | 900 | 3.4E-01 | 1200 | 3.1E-01 | 2700 | 6.1E-01 | 4200 | 1.0E-01 |
| 310 | < 1.0E-05 | 610 | 3.0E-01 | 910 | 3.4E-01 | 1250 | 3.3E-01 | 2750 | 2.8E-01 | 4250 | 9.3E-02 |
| 320 | < 1.0E-05 | 620 | 3.0E-01 | 920 | 3.3E-01 | 1300 | 3.5E-01 | 2800 | 1.5E-01 | 4300 | 7.3E-02 |
| 330 | 2.0E-04 | 630 | 3.0E-01 | 930 | 3.3E-01 | 1350 | 3.9E-01 | 2850 | 1.3E-01 | 4350 | 5.7E-02 |
| 340 | 6.0E-03 | 640 | 3.1E-01 | 940 | 3.2E-01 | 1400 | 4.2E-01 | 2900 | 1.5E-01 | 4400 | 4.0E-02 |
| 350 | 3.4E-02 | 650 | 3.1E-01 | 950 | 3.2E-01 | 1450 | 4.5E-01 | 2950 | 1.7E-01 | 4450 | 2.5E-02 |
| 360 | 8.9E-02 | 660 | 3.2E-01 | 960 | 3.1E-01 | 1500 | 4.8E-01 | 3000 | 1.9E-01 | 4500 | 1.6E-02 |
| 370 | 1.4E-01 | 670 | 3.3E-01 | 970 | 3.1E-01 | 1550 | 4.9E-01 | 3050 | 2.2E-01 | 4550 | 1.0E-02 |
| 380 | 1.4E-01 | 680 | 3.5E-01 | 980 | 3.0E-01 | 1600 | 5.1E-01 | 3100 | 2.4E-01 | 4600 | 6.2E-03 |
| 390 | 2.3E-01 | 690 | 3.7E-01 | 990 | 3.0E-01 | 1650 | 5.1E-01 | 3150 | 2.7E-01 | 4650 | 4.0E-03 |
| 400 | 2.7E-01 | 700 | 3.9E-01 | 1000 | 3.0E-01 | 1700 | 5.1E-01 | 3200 | 3.0E-01 | 4700 | 2.1E-03 |
| 410 | 2.8E-01 | 710 | 4.0E-01 | 1010 | 3.0E-01 | 1750 | 5.1E-01 | 3250 | 3.3E-01 | 4750 | 1.2E-03 |
| 420 | 2.8E-01 | 720 | 4.1E-01 | 1020 | 2.9E-01 | 1800 | 5.2E-01 | 3300 | 3.4E-01 | 4800 | 7.3E-04 |
| 430 | 2.9E-01 | 730 | 4.1E-01 | 1030 | 2.9E-01 | 1850 | 5.2E-01 | 3350 | 3.2E-01 | 4850 | 4.7E-04 |
| 440 | 2.9E-01 | 740 | 4.1E-01 | 1040 | 2.9E-01 | 1900 | 5.3E-01 | 3400 | 2.7E-01 | 4900 | 2.8E-04 |
| 450 | 3.0E-01 | 750 | 4.1E-01 | 1050 | 2.9E-01 | 1950 | 5.4E-01 | 3450 | 2.1E-01 | 4950 | 1.4E-04 |
| 460 | 3.2E-01 | 760 | 4.1E-01 | 1060 | 2.9E-01 | 2000 | 5.5E-01 | 3500 | 1.4E-01 | 5000 | 5.2E-05 |
| 470 | 3.1E-01 | 770 | 4.1E-01 | 1070 | 2.9E-01 | 2050 | 5.7E-01 | 3550 | 9.4E-02 | 5050 | 1.8E-05 |
| 480 | 3.1E-01 | 780 | 4.0E-01 | 1080 | 2.9E-01 | 2100 | 5.8E-01 | 3600 | 7.0E-02 | 5100 | < 1.0E-05 |
| 490 | 3.0E-01 | 790 | 4.0E-01 | 1090 | 2.9E-01 | 2150 | 5.9E-01 | 3650 | 5.6E-02 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## NG5

| Density | |
|---|---|
| ρ [g/cm³] | 2.43 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Bubble content | |
|---|---|
| Bubble class | 2 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Chemical resistance | |
|---|---|
| FR class | 1 |
| SR class | 3.2 |
| AR class | 2.0 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| τi (405 nm) | = | 0.56 | ± 0.03 |
| τi (546 nm) | = | 0.57 | ± 0.03 |
| τi (694 nm) | = | 0.62 | ± 0.03 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 474 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 6.6 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 7.3 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.50 |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |

**Notes**

Ionically colored glass

Neutral density filter

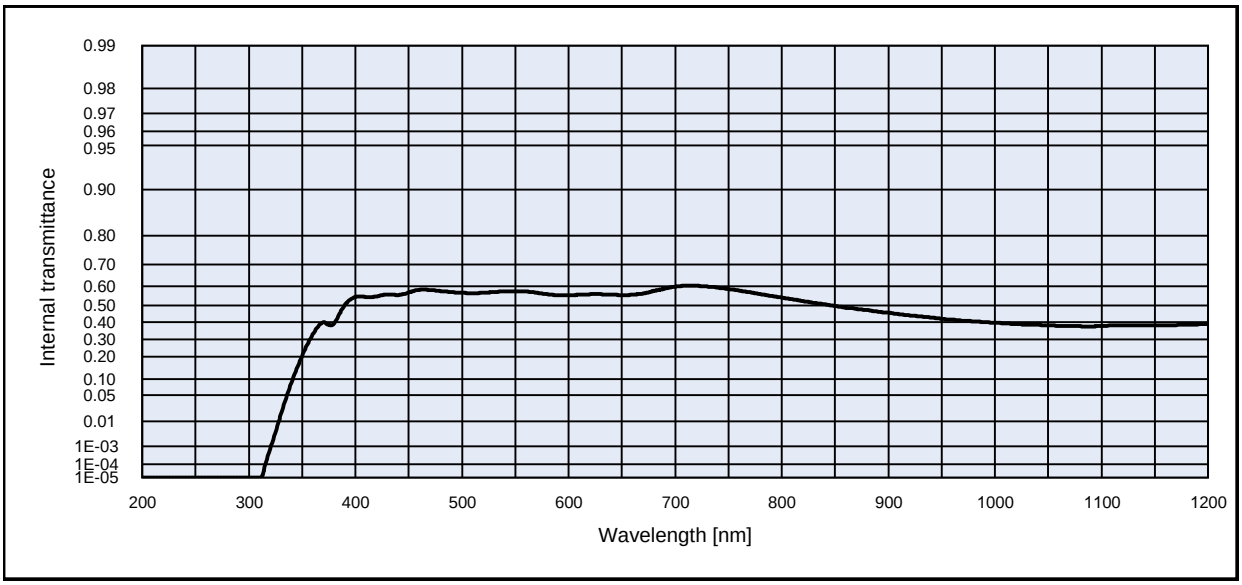
**All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".**

**Colorimetric evaluation**

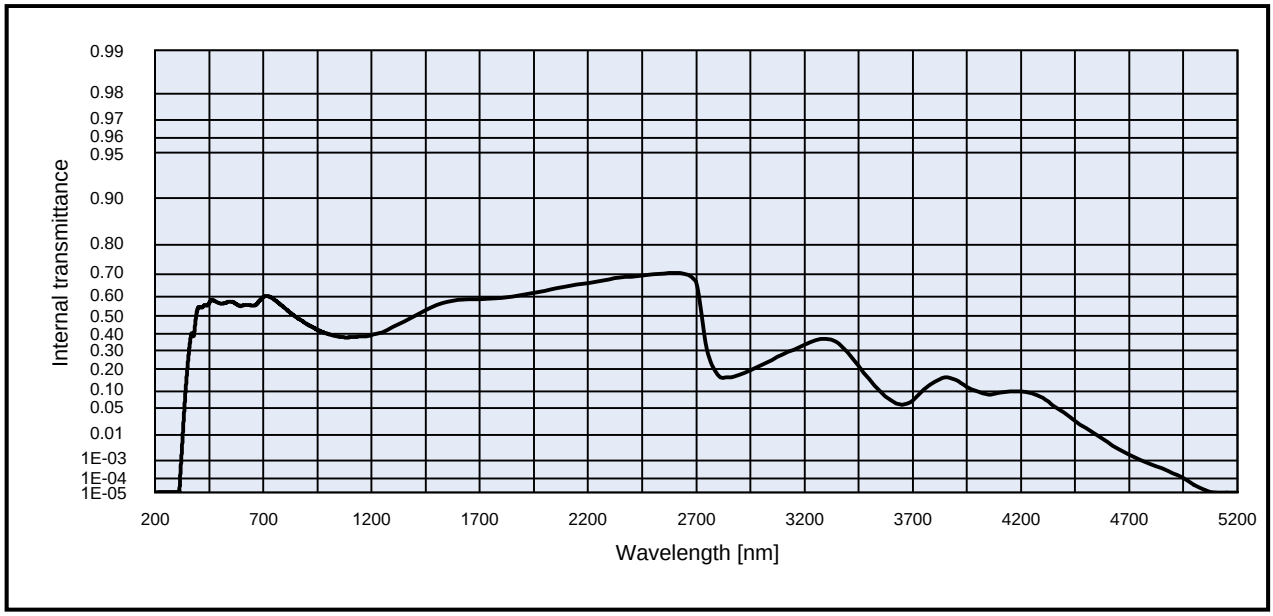
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# NG5




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 5.7E-01 | 800 | 5.4E-01 | 1100 | 3.8E-01 | 2200 | 6.6E-01 | 3700 | 7.1E-02 |
| 210 | < 1.0E-05 | 510 | 5.7E-01 | 810 | 5.3E-01 | 1110 | 3.8E-01 | 2250 | 6.7E-01 | 3750 | 1.1E-01 |
| 220 | < 1.0E-05 | 520 | 5.7E-01 | 820 | 5.2E-01 | 1120 | 3.8E-01 | 2300 | 6.8E-01 | 3800 | 1.4E-01 |
| 230 | < 1.0E-05 | 530 | 5.7E-01 | 830 | 5.1E-01 | 1130 | 3.8E-01 | 2350 | 6.9E-01 | 3850 | 1.6E-01 |
| 240 | < 1.0E-05 | 540 | 5.8E-01 | 840 | 5.1E-01 | 1140 | 3.8E-01 | 2400 | 6.9E-01 | 3900 | 1.5E-01 |
| 250 | < 1.0E-05 | 550 | 5.8E-01 | 850 | 5.0E-01 | 1150 | 3.8E-01 | 2450 | 6.9E-01 | 3950 | 1.2E-01 |
| 260 | < 1.0E-05 | 560 | 5.7E-01 | 860 | 4.9E-01 | 1160 | 3.8E-01 | 2500 | 7.0E-01 | 4000 | 1.0E-01 |
| 270 | < 1.0E-05 | 570 | 5.7E-01 | 870 | 4.8E-01 | 1170 | 3.8E-01 | 2550 | 7.0E-01 | 4050 | 8.9E-02 |
| 280 | < 1.0E-05 | 580 | 5.6E-01 | 880 | 4.7E-01 | 1180 | 3.9E-01 | 2600 | 7.0E-01 | 4100 | 9.5E-02 |
| 290 | < 1.0E-05 | 590 | 5.5E-01 | 890 | 4.6E-01 | 1190 | 3.9E-01 | 2650 | 7.0E-01 | 4150 | 1.0E-01 |
| 300 | < 1.0E-05 | 600 | 5.5E-01 | 900 | 4.6E-01 | 1200 | 3.9E-01 | 2700 | 6.6E-01 | 4200 | 1.0E-01 |
| 310 | < 1.0E-05 | 610 | 5.6E-01 | 910 | 4.5E-01 | 1250 | 4.1E-01 | 2750 | 3.1E-01 | 4250 | 9.4E-02 |
| 320 | 7.4E-04 | 620 | 5.6E-01 | 920 | 4.4E-01 | 1300 | 4.4E-01 | 2800 | 1.7E-01 | 4300 | 7.8E-02 |
| 330 | 1.6E-02 | 630 | 5.6E-01 | 930 | 4.4E-01 | 1350 | 4.7E-01 | 2850 | 1.6E-01 | 4350 | 5.5E-02 |
| 340 | 8.6E-02 | 640 | 5.6E-01 | 940 | 4.3E-01 | 1400 | 5.0E-01 | 2900 | 1.7E-01 | 4400 | 4.0E-02 |
| 350 | 2.1E-01 | 650 | 5.6E-01 | 950 | 4.2E-01 | 1450 | 5.3E-01 | 2950 | 1.9E-01 | 4450 | 2.5E-02 |
| 360 | 3.3E-01 | 660 | 5.6E-01 | 960 | 4.2E-01 | 1500 | 5.6E-01 | 3000 | 2.2E-01 | 4500 | 1.6E-02 |
| 370 | 4.0E-01 | 670 | 5.6E-01 | 970 | 4.1E-01 | 1550 | 5.8E-01 | 3050 | 2.5E-01 | 4550 | 1.0E-02 |
| 380 | 3.9E-01 | 680 | 5.8E-01 | 980 | 4.1E-01 | 1600 | 5.9E-01 | 3100 | 2.8E-01 | 4600 | 5.8E-03 |
| 390 | 5.0E-01 | 690 | 5.9E-01 | 990 | 4.0E-01 | 1650 | 5.9E-01 | 3150 | 3.1E-01 | 4650 | 3.2E-03 |
| 400 | 5.5E-01 | 700 | 6.0E-01 | 1000 | 4.0E-01 | 1700 | 5.9E-01 | 3200 | 3.4E-01 | 4700 | 1.8E-03 |
| 410 | 5.5E-01 | 710 | 6.0E-01 | 1010 | 3.9E-01 | 1750 | 5.9E-01 | 3250 | 3.6E-01 | 4750 | 1.0E-03 |
| 420 | 5.5E-01 | 720 | 6.0E-01 | 1020 | 3.9E-01 | 1800 | 6.0E-01 | 3300 | 3.7E-01 | 4800 | 6.6E-04 |
| 430 | 5.6E-01 | 730 | 6.0E-01 | 1030 | 3.9E-01 | 1850 | 6.0E-01 | 3350 | 3.5E-01 | 4850 | 4.0E-04 |
| 440 | 5.6E-01 | 740 | 5.9E-01 | 1040 | 3.8E-01 | 1900 | 6.1E-01 | 3400 | 2.9E-01 | 4900 | 2.1E-04 |
| 450 | 5.7E-01 | 750 | 5.9E-01 | 1050 | 3.8E-01 | 1950 | 6.2E-01 | 3450 | 2.2E-01 | 4950 | 1.1E-04 |
| 460 | 5.8E-01 | 760 | 5.8E-01 | 1060 | 3.8E-01 | 2000 | 6.3E-01 | 3500 | 1.5E-01 | 5000 | 3.9E-05 |
| 470 | 5.8E-01 | 770 | 5.7E-01 | 1070 | 3.8E-01 | 2050 | 6.4E-01 | 3550 | 1.0E-01 | 5050 | 1.5E-05 |
| 480 | 5.8E-01 | 780 | 5.6E-01 | 1080 | 3.8E-01 | 2100 | 6.5E-01 | 3600 | 7.0E-02 | 5100 | < 1.0E-05 |
| 490 | 5.7E-01 | 790 | 5.5E-01 | 1090 | 3.8E-01 | 2150 | 6.6E-01 | 3650 | 5.9E-02 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## NG9

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| τi (405 nm) | = | 0.025 | ± 0.01 |
| τi (546 nm) | = | 0.04 | ± 0.02 |
| τi (694 nm) | = | 0.08 | ± 0.02 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 587.6 | He | 1.51 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.45 |

| Bubble content | |
|---|---|
| Bubble class | 2 |

| Chemical resistance | |
|---|---|
| FR class | 1 |
| SR class | 3.2 |
| AR class | 2.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 470 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 6.4 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 7.2 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |

| Notes |
|---|
| |
| Ionically colored glass |
| |
| Neutral density filter |
| |
| |
| |
| |
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| |
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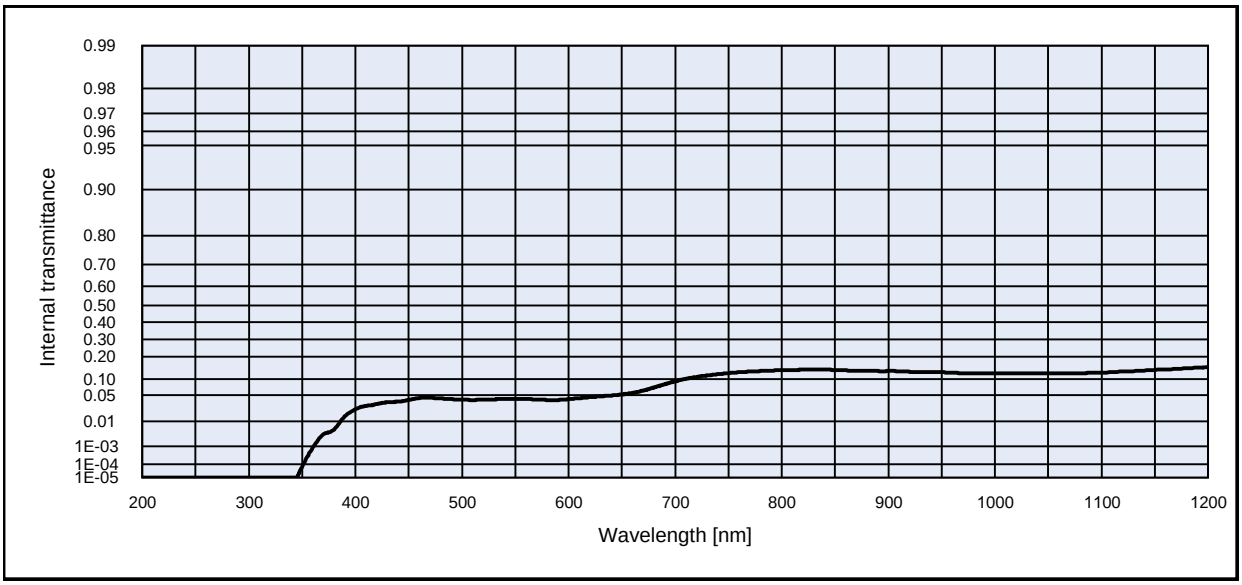
| |
| |
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

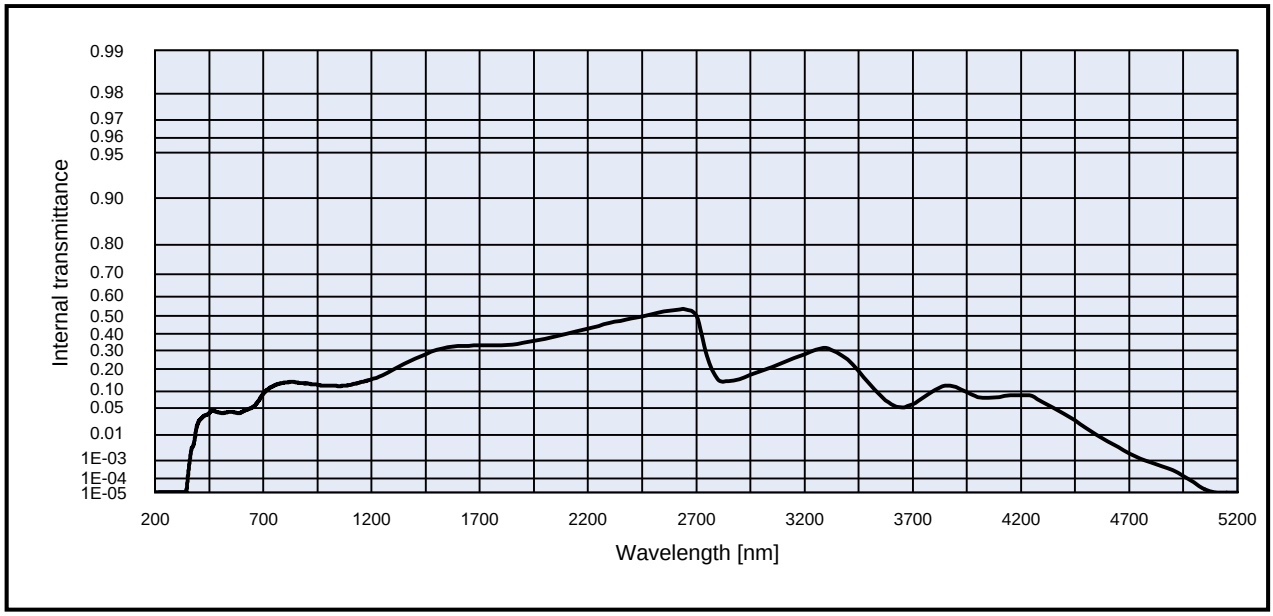
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# NG9




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 4.0E-02 | 800 | 1.4E-01 | 1100 | 1.3E-01 | 2200 | 4.3E-01 | 3700 | 6.0E-02 |
| 210 | < 1.0E-05 | 510 | 3.9E-02 | 810 | 1.4E-01 | 1110 | 1.3E-01 | 2250 | 4.4E-01 | 3750 | 8.1E-02 |
| 220 | < 1.0E-05 | 520 | 3.9E-02 | 820 | 1.4E-01 | 1120 | 1.3E-01 | 2300 | 4.6E-01 | 3800 | 1.1E-01 |
| 230 | < 1.0E-05 | 530 | 4.0E-02 | 830 | 1.4E-01 | 1130 | 1.3E-01 | 2350 | 4.7E-01 | 3850 | 1.2E-01 |
| 240 | < 1.0E-05 | 540 | 4.1E-02 | 840 | 1.4E-01 | 1140 | 1.3E-01 | 2400 | 4.9E-01 | 3900 | 1.2E-01 |
| 250 | < 1.0E-05 | 550 | 4.2E-02 | 850 | 1.4E-01 | 1150 | 1.4E-01 | 2450 | 5.0E-01 | 3950 | 9.9E-02 |
| 260 | < 1.0E-05 | 560 | 4.1E-02 | 860 | 1.3E-01 | 1160 | 1.4E-01 | 2500 | 5.1E-01 | 4000 | 8.0E-02 |
| 270 | < 1.0E-05 | 570 | 4.0E-02 | 870 | 1.3E-01 | 1170 | 1.4E-01 | 2550 | 5.3E-01 | 4050 | 7.8E-02 |
| 280 | < 1.0E-05 | 580 | 3.9E-02 | 880 | 1.3E-01 | 1180 | 1.4E-01 | 2600 | 5.3E-01 | 4100 | 8.0E-02 |
| 290 | < 1.0E-05 | 590 | 3.9E-02 | 890 | 1.3E-01 | 1190 | 1.5E-01 | 2650 | 5.3E-01 | 4150 | 8.6E-02 |
| 300 | < 1.0E-05 | 600 | 4.1E-02 | 900 | 1.3E-01 | 1200 | 1.5E-01 | 2700 | 5.0E-01 | 4200 | 8.6E-02 |
| 310 | < 1.0E-05 | 610 | 4.3E-02 | 910 | 1.3E-01 | 1250 | 1.7E-01 | 2750 | 2.7E-01 | 4250 | 8.4E-02 |
| 320 | < 1.0E-05 | 620 | 4.5E-02 | 920 | 1.3E-01 | 1300 | 2.0E-01 | 2800 | 1.5E-01 | 4300 | 6.5E-02 |
| 330 | < 1.0E-05 | 630 | 4.7E-02 | 930 | 1.3E-01 | 1350 | 2.3E-01 | 2850 | 1.4E-01 | 4350 | 5.0E-02 |
| 340 | < 1.0E-05 | 640 | 4.9E-02 | 940 | 1.3E-01 | 1400 | 2.5E-01 | 2900 | 1.5E-01 | 4400 | 3.7E-02 |
| 350 | 6.4E-05 | 650 | 5.2E-02 | 950 | 1.3E-01 | 1450 | 2.8E-01 | 2950 | 1.7E-01 | 4450 | 2.6E-02 |
| 360 | 8.5E-04 | 660 | 5.5E-02 | 960 | 1.2E-01 | 1500 | 3.1E-01 | 3000 | 1.9E-01 | 4500 | 1.6E-02 |
| 370 | 3.4E-03 | 670 | 6.2E-02 | 970 | 1.2E-01 | 1550 | 3.2E-01 | 3050 | 2.1E-01 | 4550 | 1.0E-02 |
| 380 | 5.3E-03 | 680 | 7.0E-02 | 980 | 1.2E-01 | 1600 | 3.3E-01 | 3100 | 2.3E-01 | 4600 | 6.2E-03 |
| 390 | 1.5E-02 | 690 | 8.1E-02 | 990 | 1.2E-01 | 1650 | 3.3E-01 | 3150 | 2.6E-01 | 4650 | 3.8E-03 |
| 400 | 2.3E-02 | 700 | 9.1E-02 | 1000 | 1.2E-01 | 1700 | 3.3E-01 | 3200 | 2.8E-01 | 4700 | 2.1E-03 |
| 410 | 2.8E-02 | 710 | 1.0E-01 | 1010 | 1.2E-01 | 1750 | 3.3E-01 | 3250 | 3.0E-01 | 4750 | 1.2E-03 |
| 420 | 3.1E-02 | 720 | 1.1E-01 | 1020 | 1.2E-01 | 1800 | 3.3E-01 | 3300 | 3.1E-01 | 4800 | 7.7E-04 |
| 430 | 3.4E-02 | 730 | 1.1E-01 | 1030 | 1.2E-01 | 1850 | 3.4E-01 | 3350 | 2.9E-01 | 4850 | 5.2E-04 |
| 440 | 3.6E-02 | 740 | 1.2E-01 | 1040 | 1.2E-01 | 1900 | 3.5E-01 | 3400 | 2.5E-01 | 4900 | 3.1E-04 |
| 450 | 3.9E-02 | 750 | 1.2E-01 | 1050 | 1.2E-01 | 1950 | 3.6E-01 | 3450 | 1.9E-01 | 4950 | 1.5E-04 |
| 460 | 4.3E-02 | 760 | 1.3E-01 | 1060 | 1.2E-01 | 2000 | 3.7E-01 | 3500 | 1.3E-01 | 5000 | 5.8E-05 |
| 470 | 4.4E-02 | 770 | 1.3E-01 | 1070 | 1.2E-01 | 2050 | 3.8E-01 | 3550 | 8.8E-02 | 5050 | 1.8E-05 |
| 480 | 4.2E-02 | 780 | 1.3E-01 | 1080 | 1.2E-01 | 2100 | 4.0E-01 | 3600 | 6.0E-02 | 5100 | < 1.0E-05 |
| 490 | 4.1E-02 | 790 | 1.3E-01 | 1090 | 1.2E-01 | 2150 | 4.1E-01 | 3650 | 5.1E-02 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## NG11

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | | |
|---|---|---|---|
| τi (405 nm) | = | 0.76 | ± 0.02 |
| τi (546 nm) | = | 0.77 | ± 0.02 |
| τi (694 nm) | = | 0.79 | ± 0.02 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 404.7 | Hg | 1.51 |
| 587.6 | He | 1.50 |
| 1014 | Hg | 1.49 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.42 |

| Bubble content | |
|---|---|
| Bubble class | 2 |

| Chemical resistance | |
|---|---|
| FR class | 1 |
| SR class | 3.4 |
| AR class | 2.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 481 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 6.9 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 7.5 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |

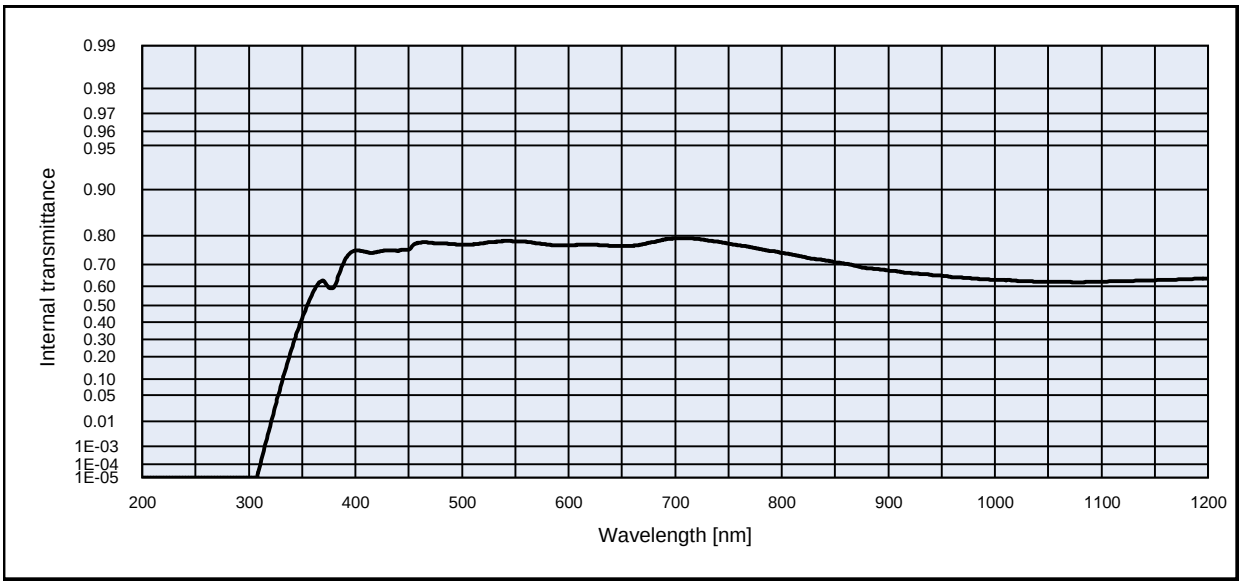
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Neutral density filter |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

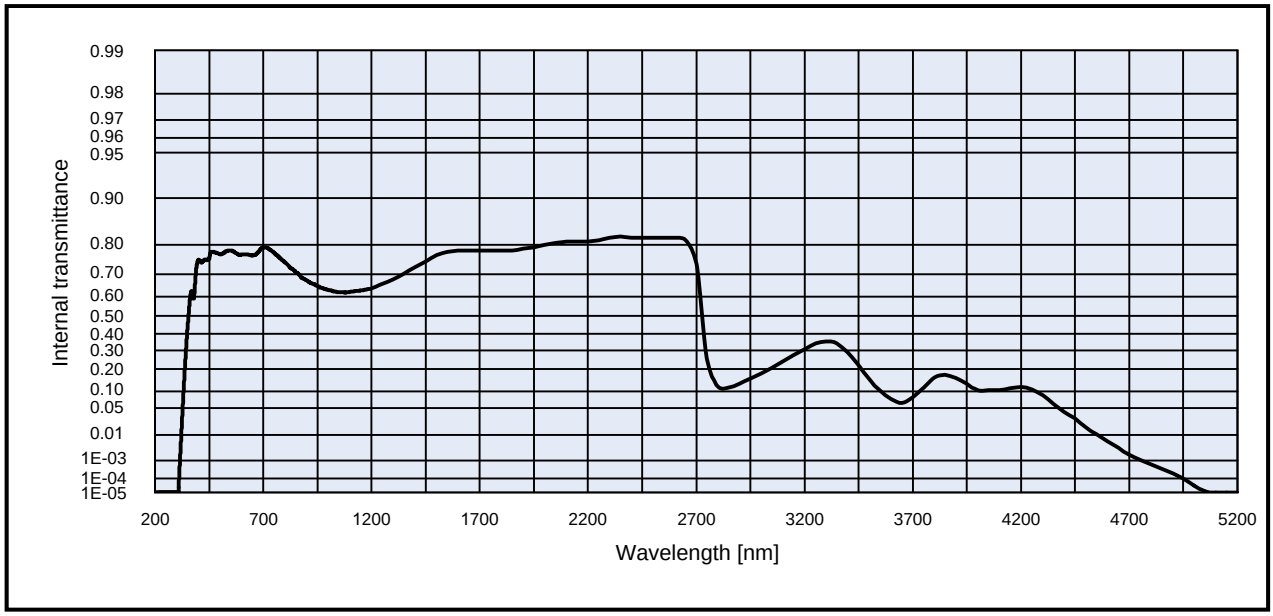
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# NG11




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 7.7E-01 | 800 | 7.4E-01 | 1100 | 6.2E-01 | 2200 | 8.1E-01 | 3700 | 8.0E-02 |
| 210 | < 1.0E-05 | 510 | 7.7E-01 | 810 | 7.4E-01 | 1110 | 6.3E-01 | 2250 | 8.1E-01 | 3750 | 1.2E-01 |
| 220 | < 1.0E-05 | 520 | 7.8E-01 | 820 | 7.3E-01 | 1120 | 6.3E-01 | 2300 | 8.2E-01 | 3800 | 1.6E-01 |
| 230 | < 1.0E-05 | 530 | 7.8E-01 | 830 | 7.2E-01 | 1130 | 6.3E-01 | 2350 | 8.2E-01 | 3850 | 1.7E-01 |
| 240 | < 1.0E-05 | 540 | 7.8E-01 | 840 | 7.2E-01 | 1140 | 6.3E-01 | 2400 | 8.2E-01 | 3900 | 1.6E-01 |
| 250 | < 1.0E-05 | 550 | 7.8E-01 | 850 | 7.1E-01 | 1150 | 6.3E-01 | 2450 | 8.2E-01 | 3950 | 1.3E-01 |
| 260 | < 1.0E-05 | 560 | 7.8E-01 | 860 | 7.0E-01 | 1160 | 6.3E-01 | 2500 | 8.2E-01 | 4000 | 1.1E-01 |
| 270 | < 1.0E-05 | 570 | 7.8E-01 | 870 | 6.9E-01 | 1170 | 6.3E-01 | 2550 | 8.2E-01 | 4050 | 1.1E-01 |
| 280 | < 1.0E-05 | 580 | 7.7E-01 | 880 | 6.9E-01 | 1180 | 6.4E-01 | 2600 | 8.2E-01 | 4100 | 1.1E-01 |
| 290 | < 1.0E-05 | 590 | 7.7E-01 | 890 | 6.8E-01 | 1190 | 6.4E-01 | 2650 | 8.1E-01 | 4150 | 1.1E-01 |
| 300 | < 1.0E-05 | 600 | 7.7E-01 | 900 | 6.8E-01 | 1200 | 6.4E-01 | 2700 | 7.4E-01 | 4200 | 1.2E-01 |
| 310 | 5.1E-05 | 610 | 7.7E-01 | 910 | 6.7E-01 | 1250 | 6.6E-01 | 2750 | 2.5E-01 | 4250 | 1.1E-01 |
| 320 | 6.6E-03 | 620 | 7.7E-01 | 920 | 6.6E-01 | 1300 | 6.8E-01 | 2800 | 1.2E-01 | 4300 | 8.7E-02 |
| 330 | 7.4E-02 | 630 | 7.7E-01 | 930 | 6.6E-01 | 1350 | 7.0E-01 | 2850 | 1.2E-01 | 4350 | 6.0E-02 |
| 340 | 2.4E-01 | 640 | 7.7E-01 | 940 | 6.6E-01 | 1400 | 7.3E-01 | 2900 | 1.3E-01 | 4400 | 4.2E-02 |
| 350 | 4.2E-01 | 650 | 7.7E-01 | 950 | 6.5E-01 | 1450 | 7.5E-01 | 2950 | 1.5E-01 | 4450 | 2.9E-02 |
| 360 | 5.7E-01 | 660 | 7.7E-01 | 960 | 6.5E-01 | 1500 | 7.7E-01 | 3000 | 1.8E-01 | 4500 | 1.7E-02 |
| 370 | 6.3E-01 | 670 | 7.7E-01 | 970 | 6.4E-01 | 1550 | 7.8E-01 | 3050 | 2.1E-01 | 4550 | 1.0E-02 |
| 380 | 6.0E-01 | 680 | 7.8E-01 | 980 | 6.4E-01 | 1600 | 7.8E-01 | 3100 | 2.4E-01 | 4600 | 6.0E-03 |
| 390 | 7.2E-01 | 690 | 7.9E-01 | 990 | 6.4E-01 | 1650 | 7.8E-01 | 3150 | 2.8E-01 | 4650 | 3.5E-03 |
| 400 | 7.5E-01 | 700 | 7.9E-01 | 1000 | 6.3E-01 | 1700 | 7.8E-01 | 3200 | 3.1E-01 | 4700 | 1.8E-03 |
| 410 | 7.5E-01 | 710 | 7.9E-01 | 1010 | 6.3E-01 | 1750 | 7.8E-01 | 3250 | 3.4E-01 | 4750 | 1.1E-03 |
| 420 | 7.5E-01 | 720 | 7.9E-01 | 1020 | 6.3E-01 | 1800 | 7.8E-01 | 3300 | 3.5E-01 | 4800 | 6.6E-04 |
| 430 | 7.5E-01 | 730 | 7.9E-01 | 1030 | 6.3E-01 | 1850 | 7.8E-01 | 3350 | 3.4E-01 | 4850 | 3.8E-04 |
| 440 | 7.5E-01 | 740 | 7.8E-01 | 1040 | 6.2E-01 | 1900 | 7.9E-01 | 3400 | 2.9E-01 | 4900 | 2.1E-04 |
| 450 | 7.6E-01 | 750 | 7.8E-01 | 1050 | 6.2E-01 | 1950 | 7.9E-01 | 3450 | 2.2E-01 | 4950 | 1.0E-04 |
| 460 | 7.8E-01 | 760 | 7.7E-01 | 1060 | 6.2E-01 | 2000 | 8.0E-01 | 3500 | 1.5E-01 | 5000 | 3.2E-05 |
| 470 | 7.8E-01 | 770 | 7.7E-01 | 1070 | 6.2E-01 | 2050 | 8.1E-01 | 3550 | 1.0E-01 | 5050 | 1.3E-05 |
| 480 | 7.8E-01 | 780 | 7.6E-01 | 1080 | 6.2E-01 | 2100 | 8.1E-01 | 3600 | 7.4E-02 | 5100 | < 1.0E-05 |
| 490 | 7.8E-01 | 790 | 7.5E-01 | 1090 | 6.2E-01 | 2150 | 8.1E-01 | 3650 | 6.3E-02 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## KG1

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Reference thickness | |
|---|---|
| d [mm] | 2 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (365 nm) | ≥ | 0.89 |
| τi (500 nm) | ≥ | 0.92 |
| τi (600 nm) | ≥ | 0.88 |
| τi (700 nm) | ≤ | 0.68 |
| τi (800 nm) | ≤ | 0.33 |
| τi (900 nm) | ≤ | 0.10 |
| τi (1060 nm) | ≤ | 0.02 |
| τi (2200 nm) | ≤ | 0.06 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 365 | Hg | 1.53 |
| 587.6 | He | 1.52 |
| | | |
| | | |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.53 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 2.0 |
| AR class | 3.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 599 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 5.3 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 6.1 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |
| | |
| | |
| | |
| | |

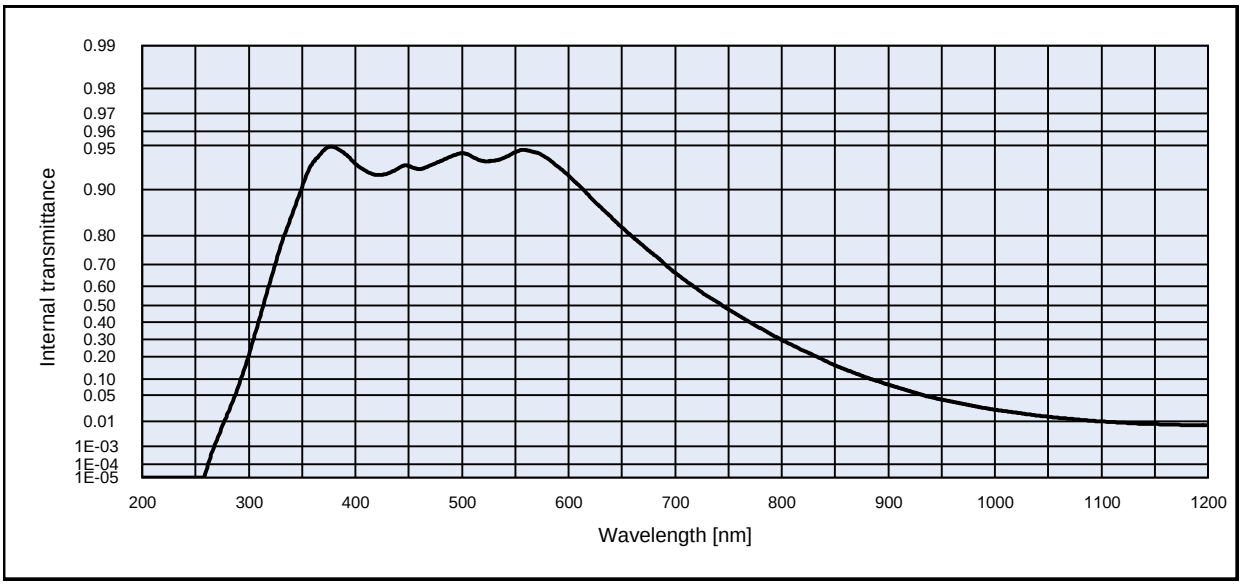
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Short pass filter |
| Heat protection filter |
| |
| |
| |
| |
| [!] |
| Long-term changes in the polished |
| surface are possible under some |
| circumstances |
| |
| V |
| Transmission changes are possible |
| under the action of intense |
| ultraviolet radiation |
| |
| **All data without tolerances are to be** |
| **understood to be reference values.** |
| **Guaranteed values are only those** |
| **values listed in the section** |
| **"Spectral values guaranteed".** |

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.444 | 0.441 | 0.438 |
| y | 0.409 | 0.411 | 0.413 |
| Y | 88 | 85 | 82 |
| $\lambda_d$ [nm] | 505 | 505 | 505 |
| $P_e$ | 0.01 | 0.01 | 0.02 |

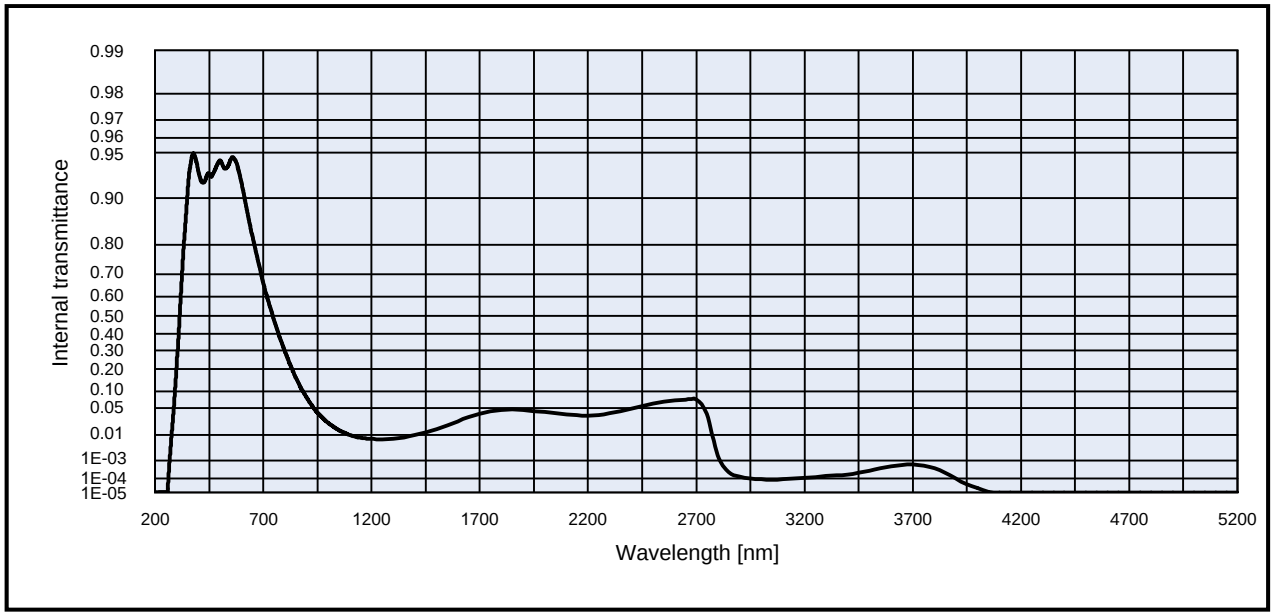
| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.420 | 0.417 | 0.415 |
| y | 0.401 | 0.402 | 0.404 |
| Y | 88 | 85 | 82 |
| $\lambda_d$ [nm] | 503 | 504 | 504 |
| $P_e$ | 0.01 | 0.01 | 0.02 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.311 | 0.309 | 0.307 |
| y | 0.330 | 0.331 | 0.332 |
| Y | 89 | 86 | 83 |
| $\lambda_d$ [nm] | 497 | 497 | 498 |
| $P_e$ | 0.01 | 0.01 | 0.02 |



# KG1

SCHOTT




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 2**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.4E-01 | 800 | 2.9E-01 | 1100 | 9.9E-03 | 2200 | 3.4E-02 | 3700 | 6.6E-04 |
| 210 | < 1.0E-05 | 510 | 9.4E-01 | 810 | 2.7E-01 | 1110 | 9.4E-03 | 2250 | 3.5E-02 | 3750 | 5.7E-04 |
| 220 | < 1.0E-05 | 520 | 9.4E-01 | 820 | 2.3E-01 | 1120 | 9.0E-03 | 2300 | 3.8E-02 | 3800 | 4.0E-04 |
| 230 | < 1.0E-05 | 530 | 9.4E-01 | 830 | 2.1E-01 | 1130 | 8.6E-03 | 2350 | 4.3E-02 | 3850 | 2.4E-04 |
| 240 | < 1.0E-05 | 540 | 9.4E-01 | 840 | 1.8E-01 | 1140 | 8.4E-03 | 2400 | 4.9E-02 | 3900 | 1.0E-04 |
| 250 | < 1.0E-05 | 550 | 9.4E-01 | 850 | 1.6E-01 | 1150 | 8.2E-03 | 2450 | 5.5E-02 | 3950 | 4.2E-05 |
| 260 | 3.5E-05 | 560 | 9.5E-01 | 860 | 1.4E-01 | 1160 | 8.0E-03 | 2500 | 6.2E-02 | 4000 | 2.1E-05 |
| 270 | 2.0E-03 | 570 | 9.4E-01 | 870 | 1.2E-01 | 1170 | 7.8E-03 | 2550 | 6.7E-02 | 4050 | 1.1E-05 |
| 280 | 1.7E-02 | 580 | 9.4E-01 | 880 | 1.0E-01 | 1180 | 7.6E-03 | 2600 | 7.1E-02 | 4100 | < 1.0E-05 |
| 290 | 7.3E-02 | 590 | 9.3E-01 | 890 | 9.2E-02 | 1190 | 7.5E-03 | 2650 | 7.3E-02 | 4150 | < 1.0E-05 |
| 300 | 2.1E-01 | 600 | 9.2E-01 | 900 | 8.0E-02 | 1200 | 7.4E-03 | 2700 | 7.2E-02 | 4200 | < 1.0E-05 |
| 310 | 4.2E-01 | 610 | 9.1E-01 | 910 | 6.9E-02 | 1250 | 7.2E-03 | 2750 | 3.7E-02 | 4250 | < 1.0E-05 |
| 320 | 6.2E-01 | 620 | 8.9E-01 | 920 | 6.0E-02 | 1300 | 7.6E-03 | 2800 | 1.7E-03 | 4300 | < 1.0E-05 |
| 330 | 7.7E-01 | 630 | 8.7E-01 | 930 | 5.2E-02 | 1350 | 8.5E-03 | 2850 | 2.5E-04 | 4350 | < 1.0E-05 |
| 340 | 8.5E-01 | 640 | 8.5E-01 | 940 | 4.5E-02 | 1400 | 9.8E-03 | 2900 | 1.3E-04 | 4400 | < 1.0E-05 |
| 350 | 9.0E-01 | 650 | 8.2E-01 | 950 | 4.0E-02 | 1450 | 1.2E-02 | 2950 | 9.9E-05 | 4450 | < 1.0E-05 |
| 360 | 9.3E-01 | 660 | 8.0E-01 | 960 | 3.5E-02 | 1500 | 1.5E-02 | 3000 | 8.9E-05 | 4500 | < 1.0E-05 |
| 370 | 9.5E-01 | 670 | 7.7E-01 | 970 | 3.2E-02 | 1550 | 1.9E-02 | 3050 | 8.6E-05 | 4550 | < 1.0E-05 |
| 380 | 9.5E-01 | 680 | 7.4E-01 | 980 | 2.8E-02 | 1600 | 2.5E-02 | 3100 | 9.0E-05 | 4600 | < 1.0E-05 |
| 390 | 9.4E-01 | 690 | 7.0E-01 | 990 | 2.5E-02 | 1650 | 3.1E-02 | 3150 | 9.8E-05 | 4650 | < 1.0E-05 |
| 400 | 9.3E-01 | 700 | 6.6E-01 | 1000 | 2.2E-02 | 1700 | 3.7E-02 | 3200 | 1.1E-04 | 4700 | < 1.0E-05 |
| 410 | 9.3E-01 | 710 | 6.3E-01 | 1010 | 2.0E-02 | 1750 | 4.2E-02 | 3250 | 1.2E-04 | 4750 | < 1.0E-05 |
| 420 | 9.2E-01 | 720 | 5.9E-01 | 1020 | 1.8E-02 | 1800 | 4.6E-02 | 3300 | 1.4E-04 | 4800 | < 1.0E-05 |
| 430 | 9.2E-01 | 730 | 5.5E-01 | 1030 | 1.7E-02 | 1850 | 4.6E-02 | 3350 | 1.6E-04 | 4850 | < 1.0E-05 |
| 440 | 9.3E-01 | 740 | 5.2E-01 | 1040 | 1.5E-02 | 1900 | 4.5E-02 | 3400 | 1.8E-04 | 4900 | < 1.0E-05 |
| 450 | 9.3E-01 | 750 | 4.8E-01 | 1050 | 1.4E-02 | 1950 | 4.3E-02 | 3450 | 2.2E-04 | 4950 | < 1.0E-05 |
| 460 | 9.3E-01 | 760 | 4.4E-01 | 1060 | 1.3E-02 | 2000 | 4.1E-02 | 3500 | 2.9E-04 | 5000 | < 1.0E-05 |
| 470 | 9.3E-01 | 770 | 4.0E-01 | 1070 | 1.2E-02 | 2050 | 3.8E-02 | 3550 | 3.9E-04 | 5050 | < 1.0E-05 |
| 480 | 9.4E-01 | 780 | 3.7E-01 | 1080 | 1.1E-02 | 2100 | 3.6E-02 | 3600 | 5.1E-04 | 5100 | < 1.0E-05 |
| 490 | 9.4E-01 | 790 | 3.3E-01 | 1090 | 1.1E-02 | 2150 | 3.4E-02 | 3650 | 6.1E-04 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## KG2

| Density | |
|---|---|
| ρ [g/cm³] | 2.52 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Reference thickness | |
|---|---|
| d [mm] | 2 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 2.0 |
| AR class | 3.0 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (365 nm) | ≥ | 0.93 |
| τi (500 nm) | ≥ | 0.94 |
| τi (600 nm) | ≥ | 0.92 |
| τi (700 nm) | ≤ | 0.83 |
| τi (800 nm) | ≤ | 0.55 |
| τi (900 nm) | ≤ | 0.28 |
| τi (1060 nm) | ≤ | 0.12 |
| τi (2200 nm) | ≤ | 0.20 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 605 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 5.4 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 6.3 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 365 | Hg | 1.53 |
| 587.6 | He | 1.51 |
| | | |
| | | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |
| | |
| | |
| | |
| | |

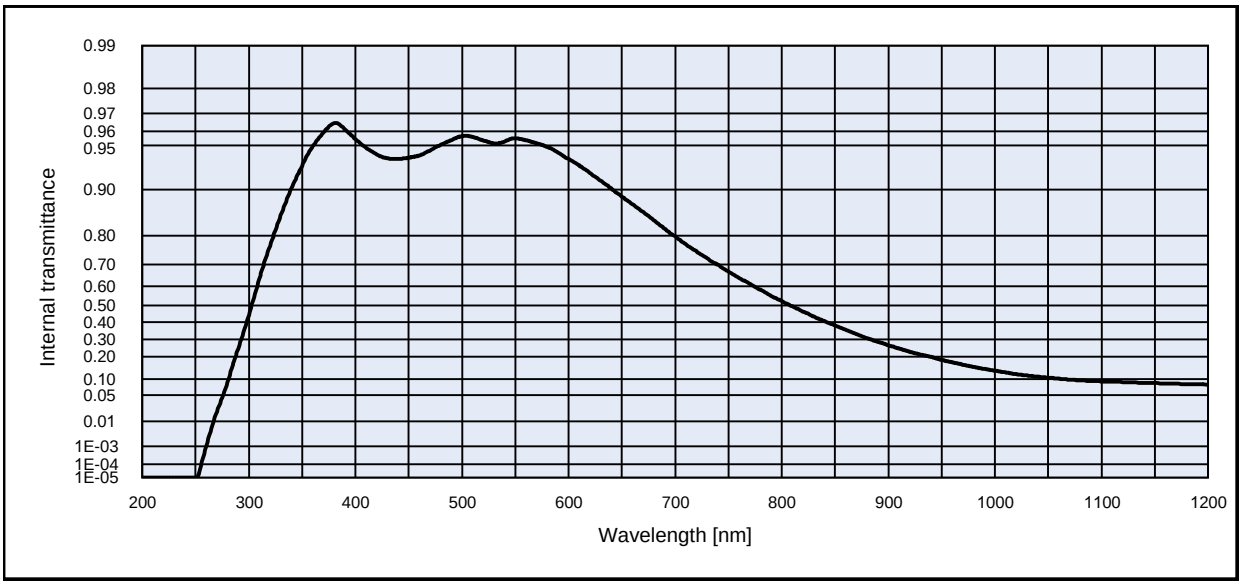
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Short pass filter |
| Heat protection filter |
| |
| |
| |
| |
| [!] |
| Long-term changes in the polished |
| surface are possible under some |
| circumstances |
| |
| V |
| Transmission changes are possible |
| under the action of intense |
| ultraviolet radiation |
| |
| **All data without tolerances are to be** |
| **understood to be reference values.** |
| **Guaranteed values are only those** |
| **values listed in the section** |
| **"Spectral values guaranteed".** |

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.446 | 0.444 | 0.442 |
| y | 0.409 | 0.410 | 0.411 |
| Y | 89 | 87 | 84 |
| $\lambda_d$ [nm] | 506 | 507 | 507 |
| $P_e$ | 0.00 | 0.01 | 0.01 |

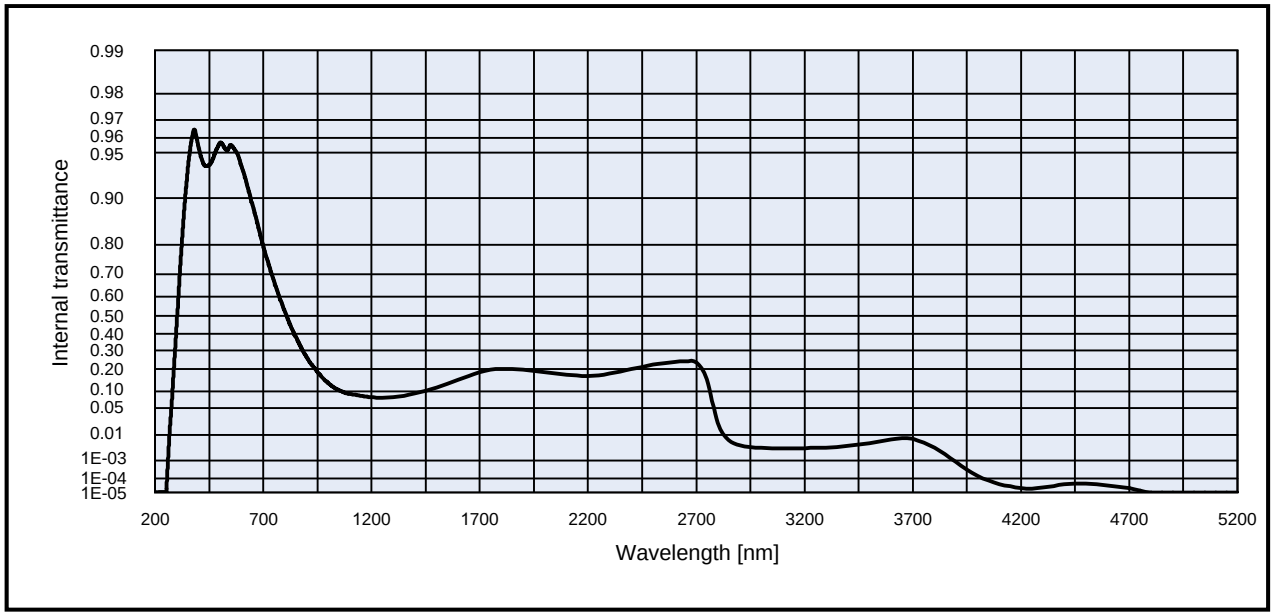
| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.422 | 0.420 | 0.419 |
| y | 0.400 | 0.401 | 0.402 |
| Y | 89 | 87 | 84 |
| $\lambda_d$ [nm] | 505 | 505 | 506 |
| $P_e$ | 0.00 | 0.01 | 0.01 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.312 | 0.311 | 0.310 |
| y | 0.330 | 0.331 | 0.331 |
| Y | 90 | 87 | 85 |
| $\lambda_d$ [nm] | 501 | 501 | 501 |
| $P_e$ | 0.00 | 0.01 | 0.01 |



# KG2

SCHOTT




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 2**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.6E-01 | 800 | 5.2E-01 | 1100 | 9.1E-02 | 2200 | 1.6E-01 | 3700 | 7.4E-03 |
| 210 | < 1.0E-05 | 510 | 9.6E-01 | 810 | 4.9E-01 | 1110 | 9.0E-02 | 2250 | 1.7E-01 | 3750 | 5.5E-03 |
| 220 | < 1.0E-05 | 520 | 9.5E-01 | 820 | 4.6E-01 | 1120 | 8.8E-02 | 2300 | 1.8E-01 | 3800 | 3.5E-03 |
| 230 | < 1.0E-05 | 530 | 9.5E-01 | 830 | 4.3E-01 | 1130 | 8.7E-02 | 2350 | 1.9E-01 | 3850 | 1.9E-03 |
| 240 | < 1.0E-05 | 540 | 9.5E-01 | 840 | 4.1E-01 | 1140 | 8.6E-02 | 2400 | 2.0E-01 | 3900 | 8.4E-04 |
| 250 | < 1.0E-05 | 550 | 9.6E-01 | 850 | 3.8E-01 | 1150 | 8.5E-02 | 2450 | 2.1E-01 | 3950 | 3.4E-04 |
| 260 | 1.0E-03 | 560 | 9.5E-01 | 860 | 3.6E-01 | 1160 | 8.4E-02 | 2500 | 2.2E-01 | 4000 | 1.5E-04 |
| 270 | 2.0E-02 | 570 | 9.5E-01 | 870 | 3.3E-01 | 1170 | 8.3E-02 | 2550 | 2.3E-01 | 4050 | 7.3E-05 |
| 280 | 8.8E-02 | 580 | 9.5E-01 | 880 | 3.1E-01 | 1180 | 8.2E-02 | 2600 | 2.4E-01 | 4100 | 4.2E-05 |
| 290 | 2.5E-01 | 590 | 9.4E-01 | 890 | 2.8E-01 | 1190 | 8.1E-02 | 2650 | 2.4E-01 | 4150 | 2.9E-05 |
| 300 | 4.4E-01 | 600 | 9.4E-01 | 900 | 2.7E-01 | 1200 | 8.0E-02 | 2700 | 2.3E-01 | 4200 | 2.2E-05 |
| 310 | 6.4E-01 | 610 | 9.3E-01 | 910 | 2.5E-01 | 1250 | 7.9E-02 | 2750 | 1.5E-01 | 4250 | 2.1E-05 |
| 320 | 7.7E-01 | 620 | 9.2E-01 | 920 | 2.3E-01 | 1300 | 8.1E-02 | 2800 | 2.3E-02 | 4300 | 2.3E-05 |
| 330 | 8.5E-01 | 630 | 9.1E-01 | 930 | 2.1E-01 | 1350 | 8.5E-02 | 2850 | 6.8E-03 | 4350 | 3.0E-05 |
| 340 | 9.0E-01 | 640 | 9.0E-01 | 940 | 2.0E-01 | 1400 | 9.3E-02 | 2900 | 4.5E-03 | 4400 | 4.2E-05 |
| 350 | 9.3E-01 | 650 | 8.9E-01 | 950 | 1.9E-01 | 1450 | 1.0E-01 | 2950 | 3.8E-03 | 4450 | 4.8E-05 |
| 360 | 9.5E-01 | 660 | 8.8E-01 | 960 | 1.7E-01 | 1500 | 1.2E-01 | 3000 | 3.5E-03 | 4500 | 4.5E-05 |
| 370 | 9.6E-01 | 670 | 8.6E-01 | 970 | 1.6E-01 | 1550 | 1.3E-01 | 3050 | 3.4E-03 | 4550 | 4.0E-05 |
| 380 | 9.7E-01 | 680 | 8.4E-01 | 980 | 1.5E-01 | 1600 | 1.5E-01 | 3100 | 3.3E-03 | 4600 | 3.6E-05 |
| 390 | 9.6E-01 | 690 | 8.2E-01 | 990 | 1.4E-01 | 1650 | 1.7E-01 | 3150 | 3.4E-03 | 4650 | 2.9E-05 |
| 400 | 9.5E-01 | 700 | 8.0E-01 | 1000 | 1.3E-01 | 1700 | 1.8E-01 | 3200 | 3.4E-03 | 4700 | 2.1E-05 |
| 410 | 9.5E-01 | 710 | 7.7E-01 | 1010 | 1.3E-01 | 1750 | 2.0E-01 | 3250 | 3.5E-03 | 4750 | 1.3E-05 |
| 420 | 9.4E-01 | 720 | 7.5E-01 | 1020 | 1.2E-01 | 1800 | 2.0E-01 | 3300 | 3.6E-03 | 4800 | < 1.0E-05 |
| 430 | 9.4E-01 | 730 | 7.3E-01 | 1030 | 1.1E-01 | 1850 | 2.0E-01 | 3350 | 3.8E-03 | 4850 | < 1.0E-05 |
| 440 | 9.4E-01 | 740 | 7.0E-01 | 1040 | 1.1E-01 | 1900 | 2.0E-01 | 3400 | 4.1E-03 | 4900 | < 1.0E-05 |
| 450 | 9.4E-01 | 750 | 6.7E-01 | 1050 | 1.0E-01 | 1950 | 1.9E-01 | 3450 | 4.6E-03 | 4950 | < 1.0E-05 |
| 460 | 9.4E-01 | 760 | 6.4E-01 | 1060 | 1.0E-01 | 2000 | 1.8E-01 | 3500 | 5.3E-03 | 5000 | < 1.0E-05 |
| 470 | 9.5E-01 | 770 | 6.1E-01 | 1070 | 9.7E-02 | 2050 | 1.8E-01 | 3550 | 6.1E-03 | 5050 | < 1.0E-05 |
| 480 | 9.5E-01 | 780 | 5.8E-01 | 1080 | 9.5E-02 | 2100 | 1.7E-01 | 3600 | 7.1E-03 | 5100 | < 1.0E-05 |
| 490 | 9.5E-01 | 790 | 5.5E-01 | 1090 | 9.3E-02 | 2150 | 1.7E-01 | 3650 | 7.9E-03 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## KG3

| Density | |
|---|---|
| ρ [g/cm³] | 2.52 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Reference thickness | |
|---|---|
| d [mm] | 2 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 2.0 |
| AR class | 4.0 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (365 nm) | ≥ | 0.86 |
| τi (500 nm) | ≥ | 0.88 |
| τi (600 nm) | ≥ | 0.83 |
| τi (700 nm) | ≤ | 0.55 |
| τi (800 nm) | ≤ | 0.14 |
| τi (900 nm) | ≤ | 0.03 |
| τi (1060 nm) | ≤ | 0.001 |
| τi (2200 nm) | ≤ | 0.01 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 581 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 5.3 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 6.1 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 365 | Hg | 1.53 |
| 587.6 | He | 1.51 |
| | | |
| | | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |
| | |
| | |
| | |
| | |

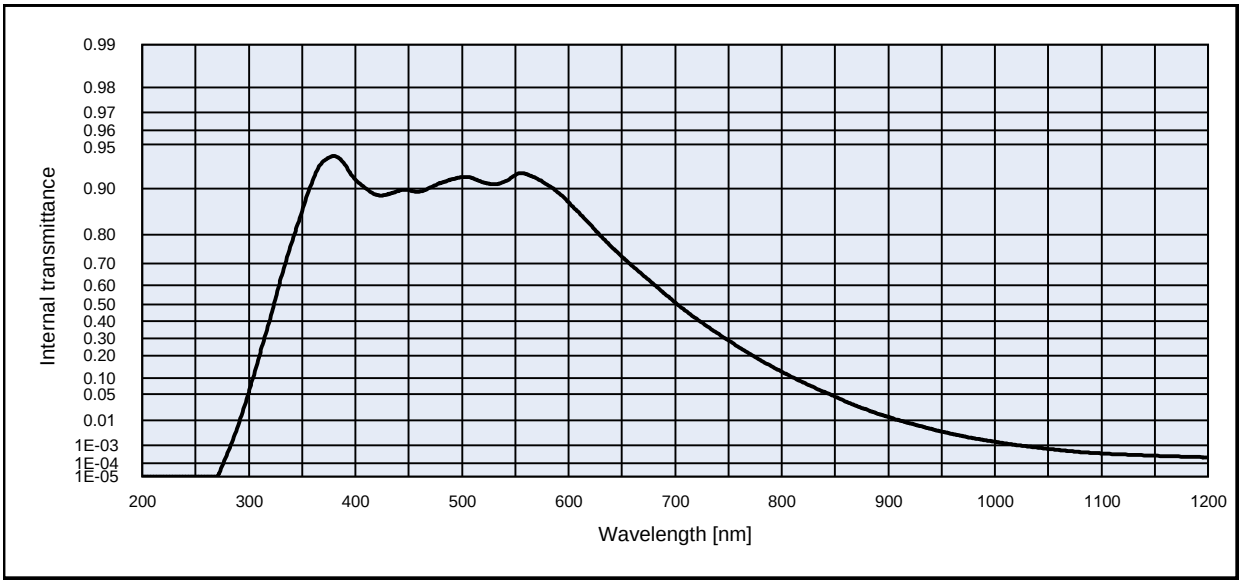
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Short pass filter |
| Heat protection filter |
| |
| |
| |
| |
| [!] |
| Long-term changes in the polished |
| surface are possible under some |
| circumstances |
| |
| V |
| Transmission changes are possible |
| under the action of intense |
| ultraviolet radiation |
| |
| **All data without tolerances are to be** |
| **understood to be reference values.** |
| **Guaranteed values are only those** |
| **values listed in the section** |
| **"Spectral values guaranteed".** |

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.442 | 0.437 | 0.432 |
| y | 0.410 | 0.413 | 0.416 |
| Y | 86 | 81 | 77 |
| $\lambda_d$ [nm] | 504 | 505 | 505 |
| $P_e$ | 0.01 | 0.02 | 0.04 |

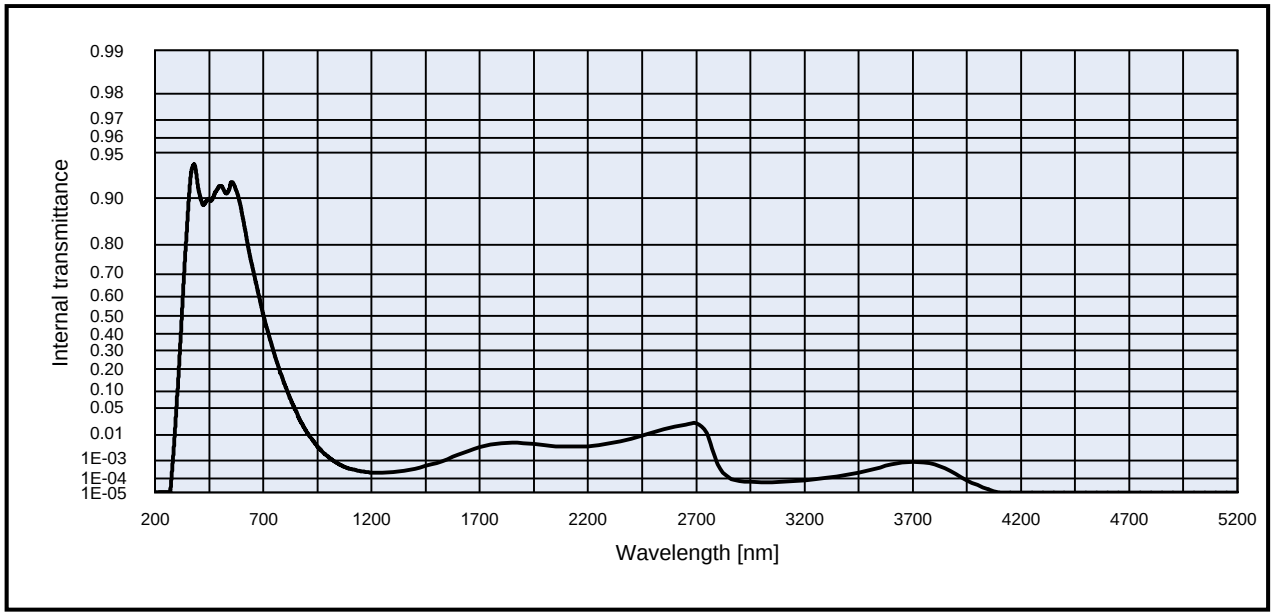
| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.418 | 0.413 | 0.409 |
| y | 0.401 | 0.404 | 0.406 |
| Y | 87 | 82 | 77 |
| $\lambda_d$ [nm] | 503 | 503 | 503 |
| $P_e$ | 0.01 | 0.02 | 0.04 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.309 | 0.306 | 0.303 |
| y | 0.330 | 0.332 | 0.333 |
| Y | 87 | 82 | 78 |
| $\lambda_d$ [nm] | 496 | 496 | 496 |
| $P_e$ | 0.01 | 0.02 | 0.03 |



# KG3

SCHOTT




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 2**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.2E-01 | 800 | 1.3E-01 | 1100 | 3.8E-04 | 2200 | 4.0E-03 | 3700 | 8.7E-04 |
| 210 | < 1.0E-05 | 510 | 9.2E-01 | 810 | 1.0E-01 | 1110 | 3.5E-04 | 2250 | 4.4E-03 | 3750 | 7.9E-04 |
| 220 | < 1.0E-05 | 520 | 9.1E-01 | 820 | 8.4E-02 | 1120 | 3.3E-04 | 2300 | 5.1E-03 | 3800 | 6.3E-04 |
| 230 | < 1.0E-05 | 530 | 9.1E-01 | 830 | 6.9E-02 | 1130 | 3.1E-04 | 2350 | 6.2E-03 | 3850 | 4.2E-04 |
| 240 | < 1.0E-05 | 540 | 9.1E-01 | 840 | 5.5E-02 | 1140 | 2.9E-04 | 2400 | 7.7E-03 | 3900 | 1.9E-04 |
| 250 | < 1.0E-05 | 550 | 9.2E-01 | 850 | 4.4E-02 | 1150 | 2.8E-04 | 2450 | 9.5E-03 | 3950 | 7.8E-05 |
| 260 | < 1.0E-05 | 560 | 9.2E-01 | 860 | 3.4E-02 | 1160 | 2.7E-04 | 2500 | 1.2E-02 | 4000 | 3.6E-05 |
| 270 | < 1.0E-05 | 570 | 9.1E-01 | 870 | 2.7E-02 | 1170 | 2.5E-04 | 2550 | 1.5E-02 | 4050 | 1.8E-05 |
| 280 | 4.0E-04 | 580 | 9.1E-01 | 880 | 2.1E-02 | 1180 | 2.4E-04 | 2600 | 1.8E-02 | 4100 | < 1.0E-05 |
| 290 | 6.9E-03 | 590 | 8.9E-01 | 890 | 1.6E-02 | 1190 | 2.3E-04 | 2650 | 2.0E-02 | 4150 | < 1.0E-05 |
| 300 | 5.5E-02 | 600 | 8.8E-01 | 900 | 1.3E-02 | 1200 | 2.3E-04 | 2700 | 2.1E-02 | 4200 | < 1.0E-05 |
| 310 | 2.0E-01 | 610 | 8.6E-01 | 910 | 1.0E-02 | 1250 | 2.2E-04 | 2750 | 1.1E-02 | 4250 | < 1.0E-05 |
| 320 | 4.1E-01 | 620 | 8.3E-01 | 920 | 8.1E-03 | 1300 | 2.4E-04 | 2800 | 6.5E-04 | 4300 | < 1.0E-05 |
| 330 | 6.3E-01 | 630 | 8.0E-01 | 930 | 6.5E-03 | 1350 | 2.9E-04 | 2850 | 1.2E-04 | 4350 | < 1.0E-05 |
| 340 | 7.7E-01 | 640 | 7.6E-01 | 940 | 5.1E-03 | 1400 | 3.8E-04 | 2900 | 6.9E-05 | 4400 | < 1.0E-05 |
| 350 | 8.6E-01 | 650 | 7.3E-01 | 950 | 4.0E-03 | 1450 | 5.4E-04 | 2950 | 6.0E-05 | 4450 | < 1.0E-05 |
| 360 | 9.1E-01 | 660 | 6.9E-01 | 960 | 3.2E-03 | 1500 | 7.6E-04 | 3000 | 5.8E-05 | 4500 | < 1.0E-05 |
| 370 | 9.3E-01 | 670 | 6.5E-01 | 970 | 2.6E-03 | 1550 | 1.2E-03 | 3050 | 5.8E-05 | 4550 | < 1.0E-05 |
| 380 | 9.4E-01 | 680 | 6.1E-01 | 980 | 2.1E-03 | 1600 | 1.8E-03 | 3100 | 6.1E-05 | 4600 | < 1.0E-05 |
| 390 | 9.3E-01 | 690 | 5.6E-01 | 990 | 1.8E-03 | 1650 | 2.7E-03 | 3150 | 6.7E-05 | 4650 | < 1.0E-05 |
| 400 | 9.1E-01 | 700 | 5.1E-01 | 1000 | 1.5E-03 | 1700 | 3.8E-03 | 3200 | 7.6E-05 | 4700 | < 1.0E-05 |
| 410 | 9.0E-01 | 710 | 4.6E-01 | 1010 | 1.2E-03 | 1750 | 4.7E-03 | 3250 | 8.9E-05 | 4750 | < 1.0E-05 |
| 420 | 8.9E-01 | 720 | 4.2E-01 | 1020 | 1.0E-03 | 1800 | 5.2E-03 | 3300 | 1.1E-04 | 4800 | < 1.0E-05 |
| 430 | 8.9E-01 | 730 | 3.7E-01 | 1030 | 8.9E-04 | 1850 | 5.4E-03 | 3350 | 1.4E-04 | 4850 | < 1.0E-05 |
| 440 | 9.0E-01 | 740 | 3.3E-01 | 1040 | 7.6E-04 | 1900 | 5.2E-03 | 3400 | 1.7E-04 | 4900 | < 1.0E-05 |
| 450 | 9.0E-01 | 750 | 2.9E-01 | 1050 | 6.7E-04 | 1950 | 4.9E-03 | 3450 | 2.2E-04 | 4950 | < 1.0E-05 |
| 460 | 9.0E-01 | 760 | 2.5E-01 | 1060 | 5.8E-04 | 2000 | 4.4E-03 | 3500 | 3.1E-04 | 5000 | < 1.0E-05 |
| 470 | 9.0E-01 | 770 | 2.1E-01 | 1070 | 5.1E-04 | 2050 | 4.1E-03 | 3550 | 4.5E-04 | 5050 | < 1.0E-05 |
| 480 | 9.1E-01 | 780 | 1.8E-01 | 1080 | 4.5E-04 | 2100 | 3.9E-03 | 3600 | 6.2E-04 | 5100 | < 1.0E-05 |
| 490 | 9.1E-01 | 790 | 1.5E-01 | 1090 | 4.1E-04 | 2150 | 3.9E-03 | 3650 | 7.9E-04 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## KG5

| Density | |
|---|---|
| ρ [g/cm³] | 2.53 |

| Reflection factor | |
|---|---|
| $P_d$ | 0.92 |

| Bubble content | |
|---|---|
| Bubble class | 3 |

| Reference thickness | |
|---|---|
| d [mm] | 2 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 3.0 |
| AR class | 4.0 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (365 nm) | ≥ | 0.80 |
| τi (500 nm) | ≥ | 0.86 |
| τi (600 nm) | ≥ | 0.80 |
| τi (700 nm) | ≤ | 0.43 |
| τi (800 nm) | ≤ | 0.09 |
| τi (900 nm) | ≤ | 0.008 |
| τi (1060 nm) | ≤ | 1 · 10-4 · |
| τi (2200 nm) | ≤ | 0.001 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 565 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 5.4 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 6.2 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 365 | Hg | 1.53 |
| 587.6 | He | 1.51 |
| | | |
| | | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |
| | |
| | |
| | |
| | |

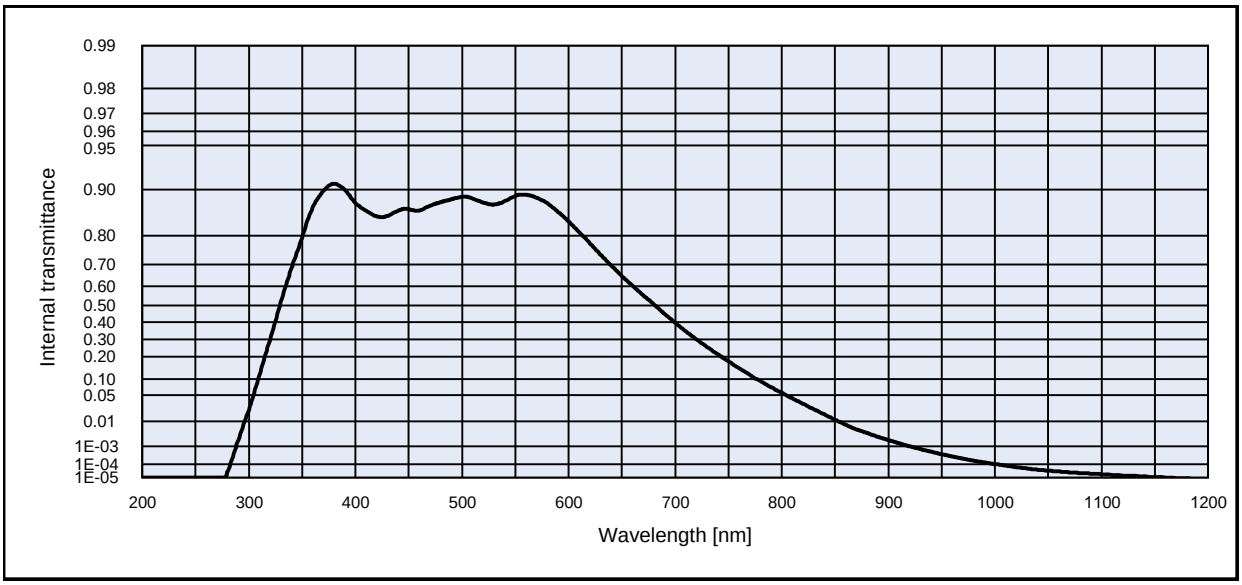
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Short pass filter |
| Heat protection filter |
| |
| |
| |
| |
| [!] |
| Long-term changes in the polished |
| surface are possible under some |
| circumstances |
| |
| V |
| Transmission changes are possible |
| under the action of intense |
| ultraviolet radiation |
| |
| **All data without tolerances are to be** |
| **understood to be reference values.** |
| **Guaranteed values are only those** |
| **values listed in the section** |
| **"Spectral values guaranteed".** |

**Colorimetric evaluation**

| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.440 | 0.434 | 0.427 |
| y | 0.411 | 0.415 | 0.418 |
| Y | 85 | 78 | 72 |
| $\lambda_d$ [nm] | 504 | 505 | 505 |
| $P_e$ | 0.02 | 0.03 | 0.05 |

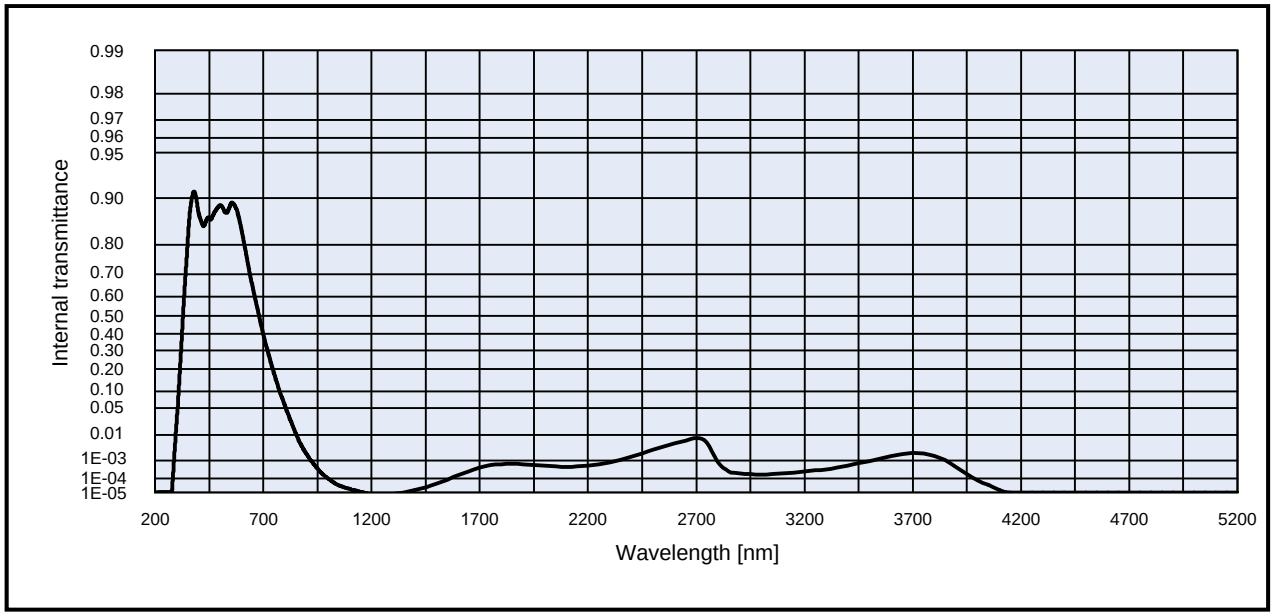
| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.416 | 0.410 | 0.404 |
| y | 0.402 | 0.406 | 0.409 |
| Y | 85 | 78 | 72 |
| $\lambda_d$ [nm] | 503 | 503 | 503 |
| $P_e$ | 0.02 | 0.03 | 0.05 |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | 0.308 | 0.304 | 0.300 |
| y | 0.331 | 0.332 | 0.334 |
| Y | 85 | 79 | 74 |
| $\lambda_d$ [nm] | 496 | 496 | 496 |
| $P_e$ | 0.02 | 0.03 | 0.04 |



# KG5

SCHOTT




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 2**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 8.9E-01 | 800 | 5.6E-02 | 1100 | 1.9E-05 | 2200 | 5.4E-04 | 3700 | 2.2E-03 |
| 210 | < 1.0E-05 | 510 | 8.9E-01 | 810 | 4.2E-02 | 1110 | 1.7E-05 | 2250 | 6.5E-04 | 3750 | 2.0E-03 |
| 220 | < 1.0E-05 | 520 | 8.8E-01 | 820 | 3.2E-02 | 1120 | 1.5E-05 | 2300 | 8.3E-04 | 3800 | 1.6E-03 |
| 230 | < 1.0E-05 | 530 | 8.7E-01 | 830 | 2.3E-02 | 1130 | 1.4E-05 | 2350 | 1.1E-03 | 3850 | 1.0E-03 |
| 240 | < 1.0E-05 | 540 | 8.8E-01 | 840 | 1.6E-02 | 1140 | 1.2E-05 | 2400 | 1.5E-03 | 3900 | 4.6E-04 |
| 250 | < 1.0E-05 | 550 | 8.9E-01 | 850 | 1.1E-02 | 1150 | 1.1E-05 | 2450 | 2.1E-03 | 3950 | 1.9E-04 |
| 260 | < 1.0E-05 | 560 | 8.9E-01 | 860 | 7.7E-03 | 1160 | 1.0E-05 | 2500 | 2.9E-03 | 4000 | 7.4E-05 |
| 270 | < 1.0E-05 | 570 | 8.9E-01 | 870 | 5.3E-03 | 1170 | < 1.0E-05 | 2550 | 4.1E-03 | 4050 | 3.7E-05 |
| 280 | 2.8E-05 | 580 | 8.8E-01 | 880 | 3.8E-03 | 1180 | < 1.0E-05 | 2600 | 5.3E-03 | 4100 | 1.6E-05 |
| 290 | 1.9E-03 | 590 | 8.6E-01 | 890 | 2.7E-03 | 1190 | < 1.0E-05 | 2650 | 6.6E-03 | 4150 | < 1.0E-05 |
| 300 | 2.2E-02 | 600 | 8.4E-01 | 900 | 2.0E-03 | 1200 | < 1.0E-05 | 2700 | 7.9E-03 | 4200 | < 1.0E-05 |
| 310 | 1.1E-01 | 610 | 8.1E-01 | 910 | 1.4E-03 | 1250 | < 1.0E-05 | 2750 | 5.6E-03 | 4250 | < 1.0E-05 |
| 320 | 3.0E-01 | 620 | 7.8E-01 | 920 | 1.0E-03 | 1300 | < 1.0E-05 | 2800 | 8.9E-04 | 4300 | < 1.0E-05 |
| 330 | 5.2E-01 | 630 | 7.4E-01 | 930 | 7.3E-04 | 1350 | 1.0E-05 | 2850 | 2.8E-04 | 4350 | < 1.0E-05 |
| 340 | 6.8E-01 | 640 | 7.0E-01 | 940 | 5.3E-04 | 1400 | 1.5E-05 | 2900 | 2.0E-04 | 4400 | < 1.0E-05 |
| 350 | 8.0E-01 | 650 | 6.5E-01 | 950 | 3.9E-04 | 1450 | 2.6E-05 | 2950 | 1.9E-04 | 4450 | < 1.0E-05 |
| 360 | 8.7E-01 | 660 | 6.0E-01 | 960 | 2.9E-04 | 1500 | 4.5E-05 | 3000 | 1.8E-04 | 4500 | < 1.0E-05 |
| 370 | 9.0E-01 | 670 | 5.6E-01 | 970 | 2.2E-04 | 1550 | 8.5E-05 | 3050 | 1.9E-04 | 4550 | < 1.0E-05 |
| 380 | 9.1E-01 | 680 | 5.1E-01 | 980 | 1.6E-04 | 1600 | 1.5E-04 | 3100 | 2.1E-04 | 4600 | < 1.0E-05 |
| 390 | 9.0E-01 | 690 | 4.5E-01 | 990 | 1.3E-04 | 1650 | 2.7E-04 | 3150 | 2.3E-04 | 4650 | < 1.0E-05 |
| 400 | 8.8E-01 | 700 | 4.0E-01 | 1000 | 9.9E-05 | 1700 | 4.4E-04 | 3200 | 2.7E-04 | 4700 | < 1.0E-05 |
| 410 | 8.6E-01 | 710 | 3.5E-01 | 1010 | 7.8E-05 | 1750 | 5.8E-04 | 3250 | 3.1E-04 | 4750 | < 1.0E-05 |
| 420 | 8.5E-01 | 720 | 3.0E-01 | 1020 | 6.2E-05 | 1800 | 6.6E-04 | 3300 | 3.6E-04 | 4800 | < 1.0E-05 |
| 430 | 8.5E-01 | 730 | 2.6E-01 | 1030 | 4.9E-05 | 1850 | 6.9E-04 | 3350 | 4.3E-04 | 4850 | < 1.0E-05 |
| 440 | 8.6E-01 | 740 | 2.1E-01 | 1040 | 4.1E-05 | 1900 | 6.5E-04 | 3400 | 5.6E-04 | 4900 | < 1.0E-05 |
| 450 | 8.7E-01 | 750 | 1.8E-01 | 1050 | 3.5E-05 | 1950 | 6.0E-04 | 3450 | 7.3E-04 | 4950 | < 1.0E-05 |
| 460 | 8.6E-01 | 760 | 1.5E-01 | 1060 | 3.0E-05 | 2000 | 5.6E-04 | 3500 | 9.3E-04 | 5000 | < 1.0E-05 |
| 470 | 8.7E-01 | 770 | 1.2E-01 | 1070 | 2.6E-05 | 2050 | 5.1E-04 | 3550 | 1.2E-03 | 5050 | < 1.0E-05 |
| 480 | 8.8E-01 | 780 | 9.2E-02 | 1080 | 2.3E-05 | 2100 | 4.9E-04 | 3600 | 1.6E-03 | 5100 | < 1.0E-05 |
| 490 | 8.8E-01 | 790 | 7.2E-02 | 1090 | 2.1E-05 | 2150 | 4.9E-04 | 3650 | 2.0E-03 | 5150 | < 1.0E-05 |

# Data Sheet

SCHOTT

## UG1

| Reflection factor | |
|---|---|
| $P_d$ | 0.91 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (365 nm) | ≥ | 0.80 |
| τi (405 nm) | ≤ | 0.10 |
| τi (694 nm) | ≤ | 0.06 |
| τi (750 nm) | ≤ | 0.53 |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 365 | Hg | 1.57 |
| 587.6 | He | 1.54 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.77 |

| Bubble content | |
|---|---|
| Bubble class | 1 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 1.0 |
| AR class | 1.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 603 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.9 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 8.9 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |

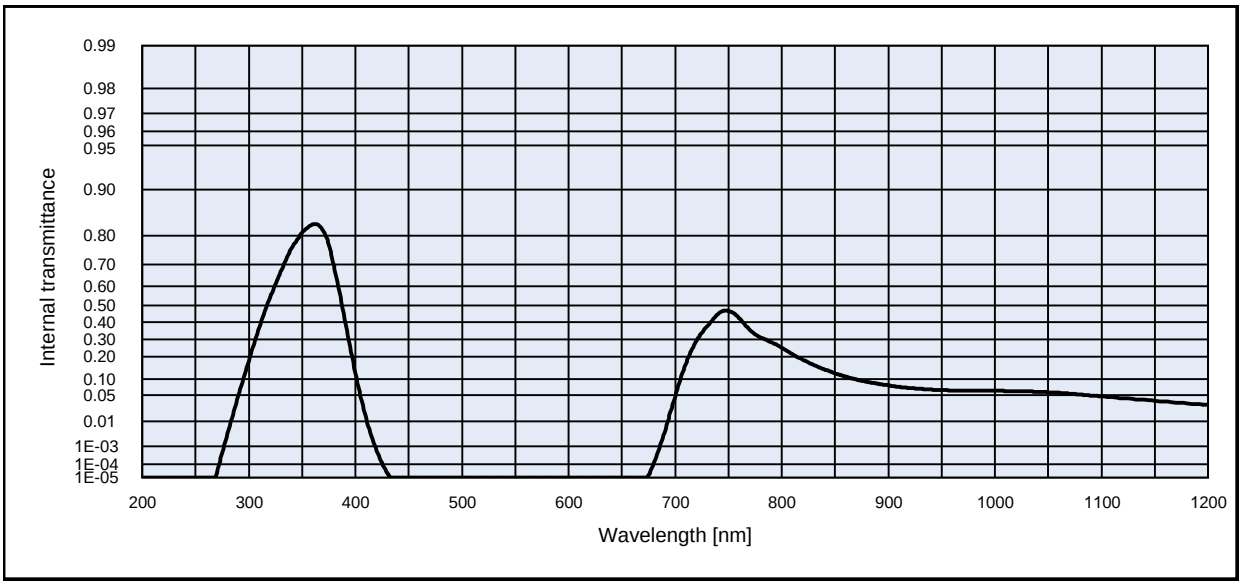
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Band pass filter |
| |
| |
| |
| V |
| Transmission changes are possible |
| under the action of intense |
| ultraviolet radiation |
| |
| |
| |
| |
| |
| |
| |
| **All data without tolerances are to be understood to be reference values. Guaranteed values are only those values listed in the section "Spectral values guaranteed".** |

**Colorimetric evaluation**

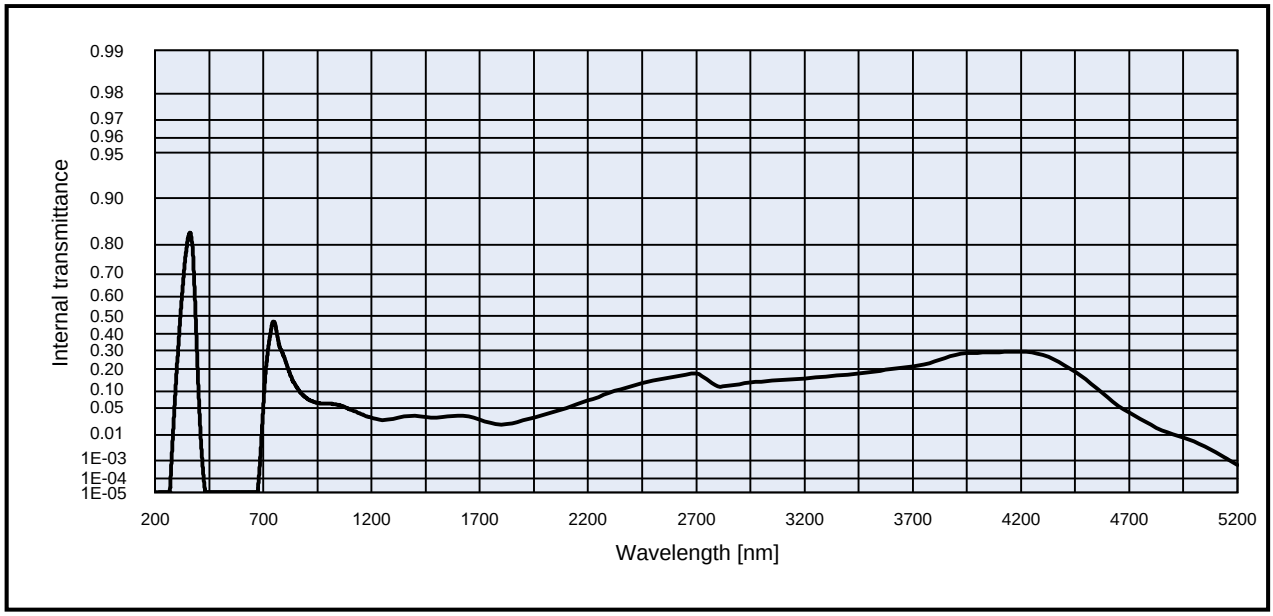
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# UG1




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | < 1.0E-05 | 800 | 2.5E-01 | 1100 | 4.7E-02 | 2200 | 7.0E-02 | 3700 | 2.1E-01 |
| 210 | < 1.0E-05 | 510 | < 1.0E-05 | 810 | 2.2E-01 | 1110 | 4.5E-02 | 2250 | 8.1E-02 | 3750 | 2.2E-01 |
| 220 | < 1.0E-05 | 520 | < 1.0E-05 | 820 | 1.9E-01 | 1120 | 4.3E-02 | 2300 | 9.5E-02 | 3800 | 2.4E-01 |
| 230 | < 1.0E-05 | 530 | < 1.0E-05 | 830 | 1.6E-01 | 1130 | 4.1E-02 | 2350 | 1.1E-01 | 3850 | 2.6E-01 |
| 240 | < 1.0E-05 | 540 | < 1.0E-05 | 840 | 1.4E-01 | 1140 | 3.9E-02 | 2400 | 1.2E-01 | 3900 | 2.8E-01 |
| 250 | < 1.0E-05 | 550 | < 1.0E-05 | 850 | 1.2E-01 | 1150 | 3.7E-02 | 2450 | 1.3E-01 | 3950 | 2.9E-01 |
| 260 | < 1.0E-05 | 560 | < 1.0E-05 | 860 | 1.1E-01 | 1160 | 3.6E-02 | 2500 | 1.4E-01 | 4000 | 2.9E-01 |
| 270 | 2.5E-05 | 570 | < 1.0E-05 | 870 | 9.8E-02 | 1170 | 3.4E-02 | 2550 | 1.5E-01 | 4050 | 2.9E-01 |
| 280 | 3.7E-03 | 580 | < 1.0E-05 | 880 | 8.9E-02 | 1180 | 3.2E-02 | 2600 | 1.6E-01 | 4100 | 2.9E-01 |
| 290 | 4.8E-02 | 590 | < 1.0E-05 | 890 | 8.3E-02 | 1190 | 3.1E-02 | 2650 | 1.7E-01 | 4150 | 2.9E-01 |
| 300 | 1.8E-01 | 600 | < 1.0E-05 | 900 | 7.8E-02 | 1200 | 3.0E-02 | 2700 | 1.8E-01 | 4200 | 2.9E-01 |
| 310 | 3.7E-01 | 610 | < 1.0E-05 | 910 | 7.3E-02 | 1250 | 2.6E-02 | 2750 | 1.5E-01 | 4250 | 2.9E-01 |
| 320 | 5.4E-01 | 620 | < 1.0E-05 | 920 | 6.9E-02 | 1300 | 2.9E-02 | 2800 | 1.2E-01 | 4300 | 2.8E-01 |
| 330 | 6.7E-01 | 630 | < 1.0E-05 | 930 | 6.7E-02 | 1350 | 3.2E-02 | 2850 | 1.2E-01 | 4350 | 2.5E-01 |
| 340 | 7.6E-01 | 640 | < 1.0E-05 | 940 | 6.5E-02 | 1400 | 3.3E-02 | 2900 | 1.3E-01 | 4400 | 2.2E-01 |
| 350 | 8.1E-01 | 650 | < 1.0E-05 | 950 | 6.3E-02 | 1450 | 3.1E-02 | 2950 | 1.4E-01 | 4450 | 1.9E-01 |
| 360 | 8.3E-01 | 660 | < 1.0E-05 | 960 | 6.2E-02 | 1500 | 3.0E-02 | 3000 | 1.4E-01 | 4500 | 1.5E-01 |
| 370 | 8.1E-01 | 670 | < 1.0E-05 | 970 | 6.1E-02 | 1550 | 3.2E-02 | 3050 | 1.4E-01 | 4550 | 1.1E-01 |
| 380 | 6.9E-01 | 680 | 1.2E-04 | 980 | 6.1E-02 | 1600 | 3.4E-02 | 3100 | 1.5E-01 | 4600 | 8.0E-02 |
| 390 | 4.2E-01 | 690 | 4.0E-03 | 990 | 6.1E-02 | 1650 | 3.2E-02 | 3150 | 1.5E-01 | 4650 | 5.5E-02 |
| 400 | 1.2E-01 | 700 | 4.7E-02 | 1000 | 6.1E-02 | 1700 | 2.8E-02 | 3200 | 1.5E-01 | 4700 | 4.0E-02 |
| 410 | 1.3E-02 | 710 | 1.6E-01 | 1010 | 6.1E-02 | 1750 | 2.3E-02 | 3250 | 1.6E-01 | 4750 | 2.8E-02 |
| 420 | 6.1E-04 | 720 | 2.9E-01 | 1020 | 6.0E-02 | 1800 | 2.0E-02 | 3300 | 1.6E-01 | 4800 | 2.0E-02 |
| 430 | 2.3E-05 | 730 | 3.8E-01 | 1030 | 6.0E-02 | 1850 | 2.2E-02 | 3350 | 1.7E-01 | 4850 | 1.4E-02 |
| 440 | < 1.0E-05 | 740 | 4.5E-01 | 1040 | 5.9E-02 | 1900 | 2.6E-02 | 3400 | 1.7E-01 | 4900 | 1.1E-02 |
| 450 | < 1.0E-05 | 750 | 4.7E-01 | 1050 | 5.7E-02 | 1950 | 3.0E-02 | 3450 | 1.8E-01 | 4950 | 8.4E-03 |
| 460 | < 1.0E-05 | 760 | 4.3E-01 | 1060 | 5.6E-02 | 2000 | 3.6E-02 | 3500 | 1.8E-01 | 5000 | 6.3E-03 |
| 470 | < 1.0E-05 | 770 | 3.6E-01 | 1070 | 5.4E-02 | 2050 | 4.3E-02 | 3550 | 1.9E-01 | 5050 | 4.1E-03 |
| 480 | < 1.0E-05 | 780 | 3.1E-01 | 1080 | 5.1E-02 | 2100 | 5.0E-02 | 3600 | 2.0E-01 | 5100 | 2.3E-03 |
| 490 | < 1.0E-05 | 790 | 2.8E-01 | 1090 | 4.9E-02 | 2150 | 5.9E-02 | 3650 | 2.1E-01 | 5150 | 1.2E-03 |

# Data Sheet

SCHOTT

## UG5

| Reflection factor | |
|---|---|
| $P_d$ | 0.91 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (254 nm) | ≥ | 0.80 |
| τi (308 nm) | ≥ | 0.94 |
| τi (405 nm) | ≤ | 0.50 |
| τi (546 nm) | ≤ | 0.05 |
| τi (633 nm) | ≤ | 0.05 |
| τi (725 nm) | ≤ | 0.85 |
| | | |
| | | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 253.7 | Hg | 1.60 |
| 365 | Hg | 1.56 |
| 587.6 | He | 1.54 |
| 1014 | Hg | 1.53 |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.85 |

| Bubble content | |
|---|---|
| Bubble class | 2 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 3.0 |
| AR class | 2.0 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 462 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 8.1 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.4 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |
| | |
| | |
| | |
| | |

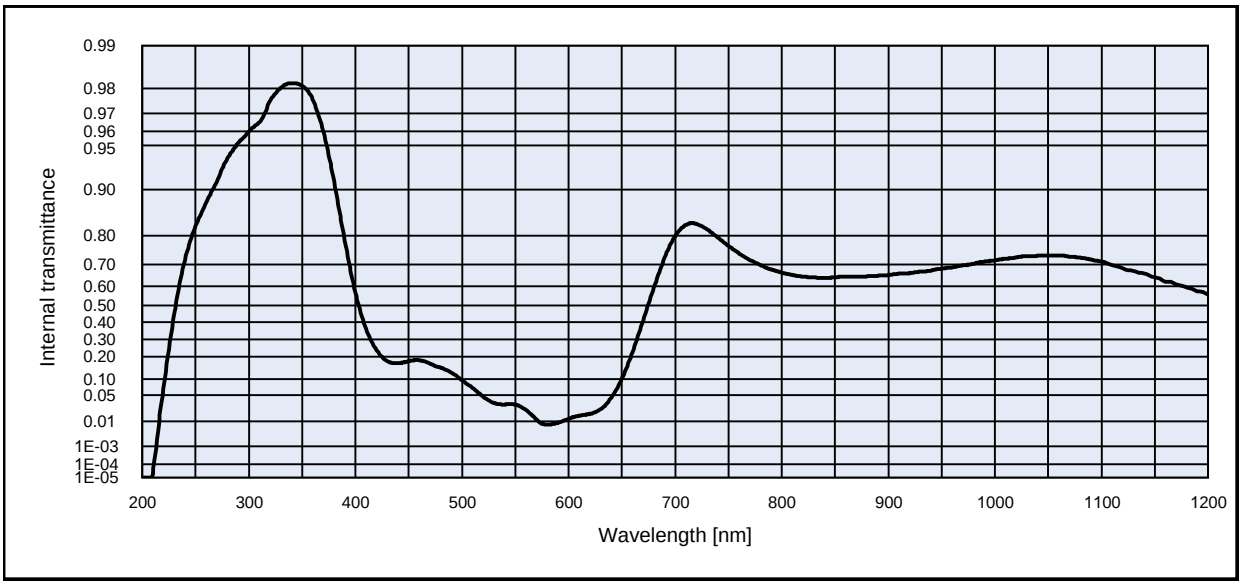
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Band pass filter |
| |
| |
| |
| [!!] |
| Long-term changes in the polished |
| surface are possible |
| |
| |
| V |
| Transmission changes are possible |
| under the action of intense |
| ultraviolet radiation |
| |
| |
| |
| **All data without tolerances are to be** |
| **understood to be reference values.** |
| **Guaranteed values are only those** |
| **values listed in the section** |
| **"Spectral values guaranteed".** |

**Colorimetric evaluation**

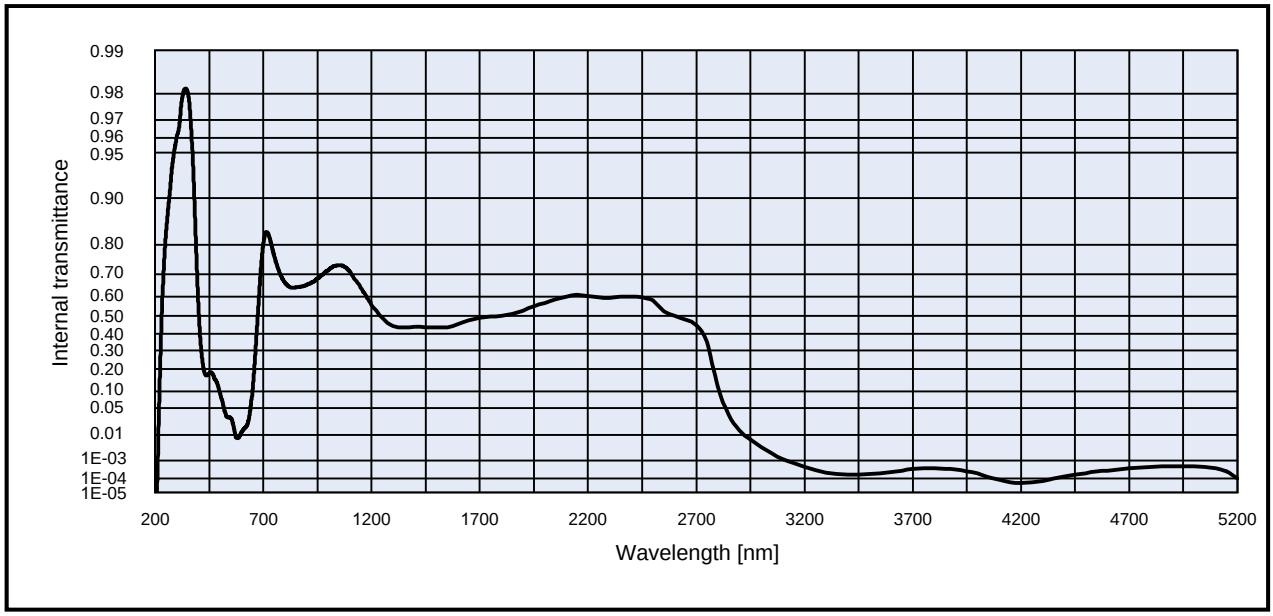
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# UG5




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | 9.5E-02 | 800 | 6.6E-01 | 1100 | 7.1E-01 | 2200 | 6.0E-01 | 3700 | 3.6E-04 |
| 210 | 2.2E-05 | 510 | 7.0E-02 | 810 | 6.6E-01 | 1110 | 7.0E-01 | 2250 | 6.0E-01 | 3750 | 4.0E-04 |
| 220 | 6.9E-02 | 520 | 4.6E-02 | 820 | 6.5E-01 | 1120 | 6.8E-01 | 2300 | 6.0E-01 | 3800 | 4.1E-04 |
| 230 | 4.5E-01 | 530 | 3.3E-02 | 830 | 6.4E-01 | 1130 | 6.7E-01 | 2350 | 6.0E-01 | 3850 | 3.9E-04 |
| 240 | 7.2E-01 | 540 | 3.0E-02 | 840 | 6.4E-01 | 1140 | 6.6E-01 | 2400 | 6.0E-01 | 3900 | 3.5E-04 |
| 250 | 8.3E-01 | 550 | 3.0E-02 | 850 | 6.4E-01 | 1150 | 6.4E-01 | 2450 | 6.0E-01 | 3950 | 2.8E-04 |
| 260 | 8.8E-01 | 560 | 2.2E-02 | 860 | 6.5E-01 | 1160 | 6.2E-01 | 2500 | 5.8E-01 | 4000 | 2.0E-04 |
| 270 | 9.1E-01 | 570 | 1.1E-02 | 870 | 6.5E-01 | 1170 | 6.1E-01 | 2550 | 5.2E-01 | 4050 | 1.3E-04 |
| 280 | 9.4E-01 | 580 | 7.8E-03 | 880 | 6.5E-01 | 1180 | 5.9E-01 | 2600 | 5.0E-01 | 4100 | 8.2E-05 |
| 290 | 9.5E-01 | 590 | 9.0E-03 | 890 | 6.5E-01 | 1190 | 5.8E-01 | 2650 | 4.8E-01 | 4150 | 5.9E-05 |
| 300 | 9.6E-01 | 600 | 1.2E-02 | 900 | 6.5E-01 | 1200 | 5.6E-01 | 2700 | 4.5E-01 | 4200 | 5.1E-05 |
| 310 | 9.7E-01 | 610 | 1.5E-02 | 910 | 6.6E-01 | 1250 | 4.9E-01 | 2750 | 3.5E-01 | 4250 | 5.4E-05 |
| 320 | 9.8E-01 | 620 | 1.7E-02 | 920 | 6.6E-01 | 1300 | 4.4E-01 | 2800 | 1.2E-01 | 4300 | 7.0E-05 |
| 330 | 9.8E-01 | 630 | 2.3E-02 | 930 | 6.7E-01 | 1350 | 4.4E-01 | 2850 | 3.6E-02 | 4350 | 1.0E-04 |
| 340 | 9.8E-01 | 640 | 4.4E-02 | 940 | 6.7E-01 | 1400 | 4.4E-01 | 2900 | 1.4E-02 | 4400 | 1.4E-04 |
| 350 | 9.8E-01 | 650 | 1.0E-01 | 950 | 6.8E-01 | 1450 | 4.4E-01 | 2950 | 7.2E-03 | 4450 | 1.7E-04 |
| 360 | 9.8E-01 | 660 | 2.3E-01 | 960 | 6.9E-01 | 1500 | 4.3E-01 | 3000 | 3.8E-03 | 4500 | 2.1E-04 |
| 370 | 9.6E-01 | 670 | 4.1E-01 | 970 | 7.0E-01 | 1550 | 4.4E-01 | 3050 | 2.0E-03 | 4550 | 2.6E-04 |
| 380 | 9.1E-01 | 680 | 6.0E-01 | 980 | 7.0E-01 | 1600 | 4.6E-01 | 3100 | 1.2E-03 | 4600 | 3.0E-04 |
| 390 | 7.9E-01 | 690 | 7.3E-01 | 990 | 7.1E-01 | 1650 | 4.8E-01 | 3150 | 7.4E-04 | 4650 | 3.5E-04 |
| 400 | 5.7E-01 | 700 | 8.0E-01 | 1000 | 7.2E-01 | 1700 | 4.9E-01 | 3200 | 4.8E-04 | 4700 | 4.0E-04 |
| 410 | 3.6E-01 | 710 | 8.3E-01 | 1010 | 7.2E-01 | 1750 | 5.0E-01 | 3250 | 3.2E-04 | 4750 | 4.3E-04 |
| 420 | 2.4E-01 | 720 | 8.3E-01 | 1020 | 7.3E-01 | 1800 | 5.0E-01 | 3300 | 2.3E-04 | 4800 | 4.7E-04 |
| 430 | 1.8E-01 | 730 | 8.2E-01 | 1030 | 7.3E-01 | 1850 | 5.1E-01 | 3350 | 1.9E-04 | 4850 | 4.9E-04 |
| 440 | 1.7E-01 | 740 | 8.0E-01 | 1040 | 7.3E-01 | 1900 | 5.3E-01 | 3400 | 1.8E-04 | 4900 | 5.0E-04 |
| 450 | 1.8E-01 | 750 | 7.7E-01 | 1050 | 7.3E-01 | 1950 | 5.5E-01 | 3450 | 1.8E-04 | 4950 | 5.0E-04 |
| 460 | 1.8E-01 | 760 | 7.4E-01 | 1060 | 7.3E-01 | 2000 | 5.7E-01 | 3500 | 1.9E-04 | 5000 | 5.0E-04 |
| 470 | 1.7E-01 | 770 | 7.2E-01 | 1070 | 7.3E-01 | 2050 | 5.9E-01 | 3550 | 2.1E-04 | 5050 | 4.6E-04 |
| 480 | 1.5E-01 | 780 | 7.0E-01 | 1080 | 7.3E-01 | 2100 | 6.0E-01 | 3600 | 2.5E-04 | 5100 | 4.0E-04 |
| 490 | 1.3E-01 | 790 | 6.8E-01 | 1090 | 7.2E-01 | 2150 | 6.1E-01 | 3650 | 3.0E-04 | 5150 | 2.7E-04 |

# Data Sheet

SCHOTT

## UG11

| Reflection factor | |
|---|---|
| $P_d$ | 0.91 |

| Reference thickness | |
|---|---|
| d [mm] | 1 |

| Spectral values guaranteed | | |
|---|---|---|
| τi (254 nm) | ≥ | 0.06 |
| τi (334 nm) | ≥ | 0.90 |
| τi (405 nm) | ≤ | 0.001 |
| τi (694 nm) | ≤ | 0.26 |
| τi (725 nm) | ≤ | 0.32 |
| | | |
| | | |
| | | |

| Refractive index n | | |
|---|---|---|
| λ [nm] | Element | n |
| 365 | Hg | 1.59 |
| 587.6 | He | 1.56 |
| | | |
| | | |

| Density | |
|---|---|
| ρ [g/cm$^3$] | 2.92 |

| Bubble content | |
|---|---|
| Bubble class | 2 |

| Chemical resistance | |
|---|---|
| FR class | 0 |
| SR class | 3.0 |
| AR class | 2.2 |

| Transformation temperature | |
|---|---|
| Tg [°C] | 545 |

| Thermal expansion | |
|---|---|
| $\alpha_{-30/+70°C}$ [$10^{-6}$/K] | 7.8 |
| $\alpha_{20/300°C}$ [$10^{-6}$/K] | 9.0 |
| $\alpha_{20/200°C}$ [$10^{-6}$/K] | |

| Temperature coefficient | |
|---|---|
| $T_K$ [nm/°C] | |
| | |
| | |
| | |
| | |

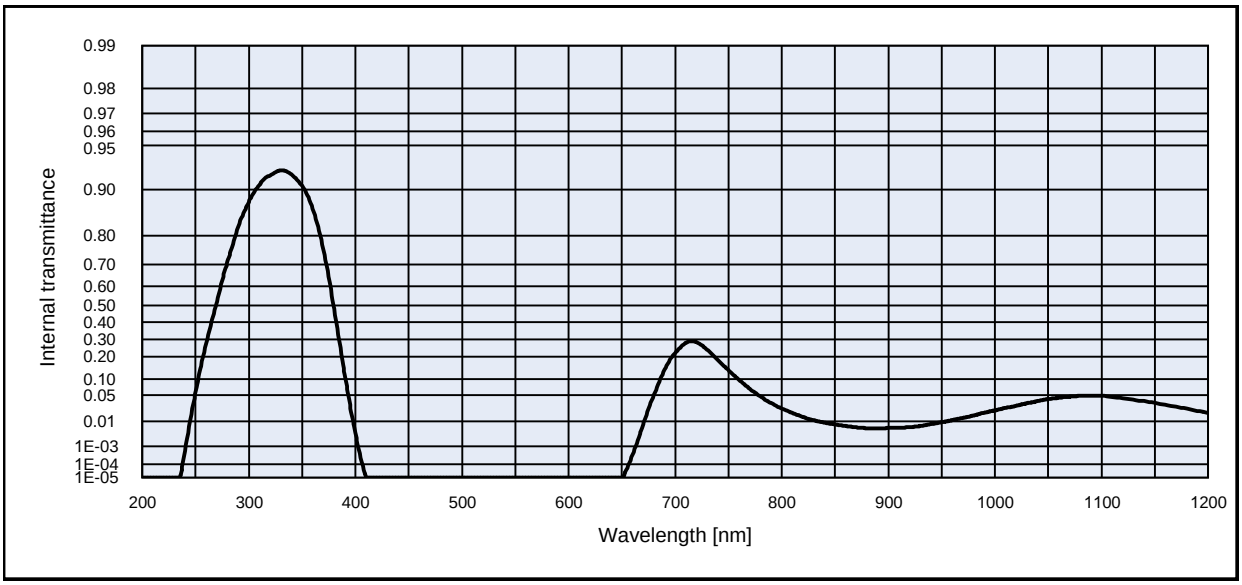
| Notes |
|---|
| |
| Ionically colored glass |
| |
| Band pass filter |
| |
| |
| |
| [!!] |
| Long-term changes in the polished |
| surface are possible |
| |
| |
| V |
| Transmission changes are possible |
| under the action of intense |
| ultraviolet radiation |
| |
| |
| |
| **All data without tolerances are to be** |
| **understood to be reference values.** |
| **Guaranteed values are only those** |
| **values listed in the section** |
| **"Spectral values guaranteed".** |

**Colorimetric evaluation**

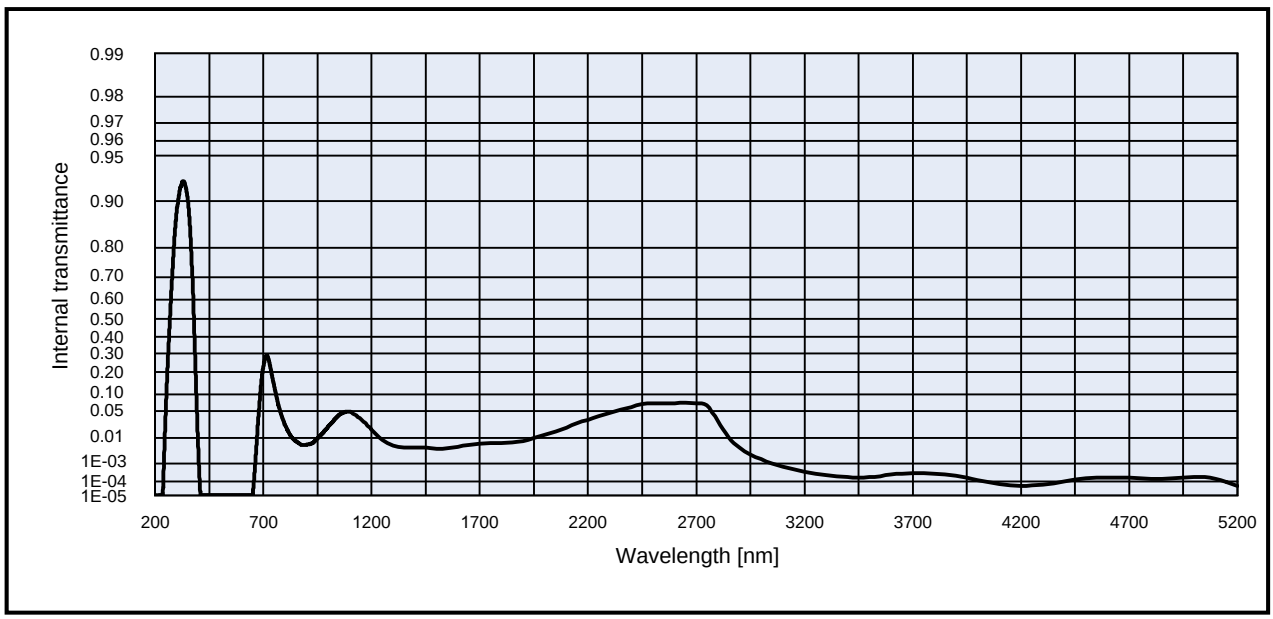
| Illuminant | A ( Planck T = 2856 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | Planck T = 3200 K | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |

| Illuminant | D65 ( $T_c$ = 6504 K ) | | |
|---|---|---|---|
| d [mm] | 1 | 2 | 3 |
| x | | | |
| y | | | |
| Y | | | |
| $\lambda_d$ [nm] | | | |
| $P_e$ | | | |



# UG11




**Internal transmittance $\tau_i$ at reference thickness d [mm] = 1**
**The internal transmittance values, tabulated and graphically represented, are reference values only**

| λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ | λ [nm] | $\tau_i$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | < 1.0E-05 | 500 | < 1.0E-05 | 800 | 2.4E-02 | 1100 | 4.9E-02 | 2200 | 3.2E-02 | 3700 | 3.2E-04 |
| 210 | < 1.0E-05 | 510 | < 1.0E-05 | 810 | 1.8E-02 | 1110 | 4.6E-02 | 2250 | 3.8E-02 | 3750 | 3.2E-04 |
| 220 | < 1.0E-05 | 520 | < 1.0E-05 | 820 | 1.4E-02 | 1120 | 4.3E-02 | 2300 | 4.6E-02 | 3800 | 3.0E-04 |
| 230 | < 1.0E-05 | 530 | < 1.0E-05 | 830 | 1.1E-02 | 1130 | 3.9E-02 | 2350 | 5.3E-02 | 3850 | 2.6E-04 |
| 240 | 6.1E-04 | 540 | < 1.0E-05 | 840 | 9.1E-03 | 1140 | 3.7E-02 | 2400 | 6.0E-02 | 3900 | 2.2E-04 |
| 250 | 5.6E-02 | 550 | < 1.0E-05 | 850 | 8.0E-03 | 1150 | 3.3E-02 | 2450 | 6.8E-02 | 3950 | 1.7E-04 |
| 260 | 2.8E-01 | 560 | < 1.0E-05 | 860 | 7.0E-03 | 1160 | 3.0E-02 | 2500 | 7.0E-02 | 4000 | 1.2E-04 |
| 270 | 5.2E-01 | 570 | < 1.0E-05 | 870 | 6.3E-03 | 1170 | 2.7E-02 | 2550 | 7.0E-02 | 4050 | 9.0E-05 |
| 280 | 7.1E-01 | 580 | < 1.0E-05 | 880 | 5.9E-03 | 1180 | 2.4E-02 | 2600 | 7.0E-02 | 4100 | 6.7E-05 |
| 290 | 8.3E-01 | 590 | < 1.0E-05 | 890 | 5.8E-03 | 1190 | 2.1E-02 | 2650 | 7.2E-02 | 4150 | 5.7E-05 |
| 300 | 8.8E-01 | 600 | < 1.0E-05 | 900 | 5.9E-03 | 1200 | 1.8E-02 | 2700 | 7.0E-02 | 4200 | 5.2E-05 |
| 310 | 9.1E-01 | 610 | < 1.0E-05 | 910 | 6.1E-03 | 1250 | 8.8E-03 | 2750 | 6.4E-02 | 4250 | 5.4E-05 |
| 320 | 9.2E-01 | 620 | < 1.0E-05 | 920 | 6.4E-03 | 1300 | 5.5E-03 | 2800 | 3.0E-02 | 4300 | 6.1E-05 |
| 330 | 9.3E-01 | 630 | < 1.0E-05 | 930 | 7.0E-03 | 1350 | 4.6E-03 | 2850 | 1.1E-02 | 4350 | 7.6E-05 |
| 340 | 9.2E-01 | 640 | < 1.0E-05 | 940 | 8.1E-03 | 1400 | 4.8E-03 | 2900 | 4.8E-03 | 4400 | 1.0E-04 |
| 350 | 9.1E-01 | 650 | < 1.0E-05 | 950 | 9.4E-03 | 1450 | 4.7E-03 | 2950 | 2.5E-03 | 4450 | 1.4E-04 |
| 360 | 8.7E-01 | 660 | 3.6E-04 | 960 | 1.1E-02 | 1500 | 4.3E-03 | 3000 | 1.6E-03 | 4500 | 1.7E-04 |
| 370 | 7.6E-01 | 670 | 8.1E-03 | 970 | 1.3E-02 | 1550 | 4.3E-03 | 3050 | 1.0E-03 | 4550 | 1.7E-04 |
| 380 | 4.8E-01 | 680 | 5.0E-02 | 980 | 1.5E-02 | 1600 | 5.0E-03 | 3100 | 7.0E-04 | 4600 | 1.8E-04 |
| 390 | 1.2E-01 | 690 | 1.4E-01 | 990 | 1.8E-02 | 1650 | 6.0E-03 | 3150 | 5.0E-04 | 4650 | 1.7E-04 |
| 400 | 4.0E-03 | 700 | 2.2E-01 | 1000 | 2.1E-02 | 1700 | 6.6E-03 | 3200 | 3.7E-04 | 4700 | 1.7E-04 |
| 410 | 1.0E-05 | 710 | 2.8E-01 | 1010 | 2.5E-02 | 1750 | 6.7E-03 | 3250 | 2.9E-04 | 4750 | 1.6E-04 |
| 420 | < 1.0E-05 | 720 | 2.8E-01 | 1020 | 2.8E-02 | 1800 | 6.8E-03 | 3300 | 2.4E-04 | 4800 | 1.5E-04 |
| 430 | < 1.0E-05 | 730 | 2.4E-01 | 1030 | 3.3E-02 | 1850 | 7.2E-03 | 3350 | 2.1E-04 | 4850 | 1.5E-04 |
| 440 | < 1.0E-05 | 740 | 1.9E-01 | 1040 | 3.7E-02 | 1900 | 8.0E-03 | 3400 | 1.8E-04 | 4900 | 1.6E-04 |
| 450 | < 1.0E-05 | 750 | 1.4E-01 | 1050 | 4.1E-02 | 1950 | 1.0E-02 | 3450 | 1.8E-04 | 4950 | 1.7E-04 |
| 460 | < 1.0E-05 | 760 | 9.7E-02 | 1060 | 4.4E-02 | 2000 | 1.2E-02 | 3500 | 1.9E-04 | 5000 | 1.9E-04 |
| 470 | < 1.0E-05 | 770 | 6.7E-02 | 1070 | 4.6E-02 | 2050 | 1.6E-02 | 3550 | 2.1E-04 | 5050 | 1.9E-04 |
| 480 | < 1.0E-05 | 780 | 4.7E-02 | 1080 | 4.8E-02 | 2100 | 2.0E-02 | 3600 | 2.6E-04 | 5100 | 1.4E-04 |
| 490 | < 1.0E-05 | 790 | 3.3E-02 | 1090 | 4.8E-02 | 2150 | 2.6E-02 | 3650 | 3.0E-04 | 5150 | 9.4E-05 |